



Neolithic Shkarat Msaied - latest results

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PREFACE

It is our pleasure to introduce this volume of papers presented at the First Conference on the Archaeology and Tourism of the Maan Governorate which was held in Petra between October 3rd and 4th 2017.

This Conference was organized by the UNESCO Chair on Heritage and Sustainable Tourism at al-Hussein Bin Talal University. This Chair is concerned with the promotion and safeguarding of cultural heritage and its preservation and sustainability for the generations to come. It aims to promote an integrated system of research, training, information and documentation in the fields of cultural heritage and sustainable tourism that contribute to the protection and promotion of cultural diversity and re-affirm the link between culture and sustainable development. It serves as a means of facilitating collaboration between high-level, internationally recognized researchers and teaching staff of al-Hussein Bin Talal University and other institutions in Jordan and elsewhere in Arab states region, as well as in other regions of the world. The activities of the Chair contribute to the achievement of the UN Millennium Development Goals and to the objectives of UNESCO's Programmes relevant to the theme of the Chair.

The aim of this Conference, which will be held every three years, is to shed more lights on the latest archaeological discoveries and to present new researches on the tourism and archaeology of the Maan region. It is hoped that this series will provide a platform where scholars, researchers and students can share knowledge, ideas and experiences.

We are deeply grateful to Professor Ali al-Qaisi, former President of al-Hussein Bin Talal University for his unlimited support and encouragement. We would like to express our sincere thanks and gratitude to Dr. Fawzi Abudanah, Dean of the Petra College for Tourism and Archaeology for everything he has done to make this gathering possible. In addition, we convey our gratitude to the staff of the college for their enormous and valuable assistance. Special thanks are due to Mr. Fawwaz Hasanat and Mr. Mohammad Twaissi for their help in providing accommodation for the participants.

This conference has been the fruit of a constructive cooperation between the UNESCO Chair, the American Center of Oriental Research (ACOR) and the Sustainable Cultural Heritage Through Engagement of Local Communities Project (SCHEP). It would not have been possible without the strong and valuable support, assistance and cooperation of SCHEP, a USAID funded project implemented by ACOR. We would like to offer our special thanks to Dr. Barbara Porter, Director of the Center, Dr. Glenn Corbett the former Associate Director of the Center and to Mr. Nizar Al Adarbeh the Chief of Party for USAID-SCHEP. We are appreciative for their continuous support, cooperation and assistance and we thank them for their generous funding in making this event both a reality and a success.

We thank the staff of the USAID-SCHEP, especially Shatha, Abdulrahman and Fareed, for all of the behind-the-scenes work they did to make this event a success.

The Editors,

PETRA'S GREAT FLOOD: SPECULATIONS ON A 4TH-5TH AD CENTURY CATASTROPHE

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Abstract

Using conventional paleo-flood reconstruction analyses, it is speculated that a catastrophic flood occurred in Petra during the 4th to 5th century AD. Evidence indicates that a high magnitude (4-6+m surge, 3+m/s velocity), and low frequency ($p= 0.001-0.0005$) flood devastated the city. Geomorphic features and characteristics were analyzed including (i) channel configurations along Wadi Mataha, (ii) relict, extant alluvia of Disi-derived sediments along Wadi Musa (in situ exposed, and in excavations), (iii) missing pavers along the Colonnaded Road indicating huge meanders produced during the event(s), and (iv) the location, morphology, and dimensions of excavated flood alluvia flanking the channel of Wadi Musa along the Colonnaded Road.

Fluvial reconstruction formulae (i.e. Mannings, Chezy) were implemented in conjunction with the examination of extant features in Wadis Mudhlim, Mataha, and Musa. These paleoflood reconstructions established flood height and discharge, meander dimension, and velocity. Dated strata excavated above and below the event sediments narrow its occurrence between the Great Earthquake of May 363 AD and the mid-5th Century. Excavated fluvial deposits (derived from the Disi Formation) excavated along the Colonnaded Road (shops XXVII-XXX), indicate that the water depth and discharge created floodwater meanders of amplitudes exceeding 45-50m, with a stream velocity of 3-3.3m/s (enough to move 1-2m boulders).

Discussions of periodic and episodic flooding in Petra are common ($p: 0.1-0.01$), however, flood levels that were catastrophic in depth, velocity, and turbulence ($p: 0.005-0.0005$), have not been previously described until today. Rushing floodwaters

entering the Bab as-Siq would have reached 2 to 3 meters in depth, accumulating to create surging high waters entering the Siq to a minor degree, with most of the floodwaters entering the northern channels of Wadi Mudhlim passing through the hewn Roman Tunnel. Water rushing down Wadi Muthlim into Wadi Mataha would have accelerated from 0.5m/s to 1.1m/s, to jump past the confluence at the Nymphaeum, to rejoin the waters in Wadi Musa along the Colonnaded Street. These merging floodwaters would have created a devastating 5-8m flood bore, accelerating to 3.3m/s into the City Center. The raging water rushed down the street leaving boulders, heaps of gravel and pebbles in its wake. The road would have been blanketed by 2 to 5m of alluvial sediments. The lower city center along Wadi Musa would have been razed, requiring months to years to remove the extensive accumulations of boulders, gravel, sand, silt, and clay.

Introduction

Since the early 19th century, western explorers and visitors to Petra often mentioned accounts of flooding along Petra's Wadi Musa and Wadi Abu 'Olleqa. More recently in 1963, 23 (or 25) French tourists were killed when a flash flood rushed through their campsite in Petra's Bab as-Siq area (Chicago Tribune April 10, 1962). In arid landscapes like that of Southern Jordan, flash floods are not uncommon, however, under the right conditions rare precipitation events of extreme magnitude can raze an area lacking flood mitigation technologies.

Montagu (1766), Burckhardt (1822, 1835), Stephens (1840), and LaBorde (in Croker 1836) described possible floods, later elaborated by prominent scholars and visitors including Brünnow & Domaszewski (1904-1909), Dalman (1908), Libbey & Hoskins (1905), Kennedy (1925), and Robinson (1930). When the noted Swiss geographer and explorer, Johann Burckhardt entered Petra in 1812, he recorded the perceptive possibility of Petra's floods, in addition to its ancient flood diversion weirs, irrigation channels, and cisterns. However, it is his description of the confluence of Wadi Musa and Wadi Mataha that may prove the most telling. As he exited the Siq and walked past the Theater, he rounded the bend to see – for the first time – the main valley of Petra. Astonished, he wrote"

"... Here the ground is covered with heaps of hewn stones, foundations of buildings, fragments of columns, and vestiges of paved streets; all clearly indicating that a large city once existed here; on the left side of the river is a rising ground extending westwards for nearly a quarter of an hour, entirely covered with similar remains. On the right bank, where the ground is more elevated, ruins of the same description are also seen. In the valley near the river, the buildings have probably been swept away by the impetuosity of the [great] winter torrents." (1822)

Explorers and visitors used terms like 'flood', 'torrents', and 'deluge' throughout their reports to describe these examples of specific observations that indicated, implied, or directly explained regular, episodic, and/or catastrophic flooding across Petra. Burckhardt (1835) explained that only very high water or 'winter torrents' could produce such scouring and ruination as witnessed along Wadi Musa in the Valley.

Discussions of sediments, boulders, and alluvium found outside the valley perched and out of place are prevalent and markedly similar in depiction. These observations were made across Petra more commonly in Wadi Musa, but also following the channels of the Bab as-Siq and al-Madras, and in the wadis of Thugra, Mataha and Mudhlim.

These past and modern accounts (Fiema 1997, Joukowsky 1998) of possible flooding in Petra described the role of periodic high flood stages along the primary wadis – flooding with recurrences of seasonal and episodic frequencies ($p: 0.05-0.001$). The most commonly described high water events indicate recurrence intervals of decades (<0.005), and not centuries or millennia (>0.005), unless use of words like 'deluge' where in fact, references to biblical flood magnitudes like those depicted in Genesis (7:17) (Stephens 1840). However, field observations and measurements actually indicate a higher water stage than seasonal or episodic floods – not high water than fills the channels to bankfull, but floodwater levels so high that the water would overtop the channels and inundate the surrounding areas by two, four or even six meters (i.e. Colonnade Road, South Portico, Temenos Gate, Qasr al-Bint). The intent of this paper is to encourage discussion as to the possibility of a catastrophic flood that may have

inundated Petra's city center during the periods of Roman stabilization and growth, and Byzantine expansion and reconstruction (Fiema 1998, Parr 1983). This field observations and physical evidence presented here do not address the role of periodic floods in Petra, but will attempt to address the possibility of a *catastrophic* flood: a rare flood having an estimate recurrence of once every 1000-2000 years (*probability: 0.001-0.0005+*), and with flood stages that exceeded the Colonnaded Road pavement by 2-4 meters.

Paleo-flood reconstruction indicates that Petra would have sustained 20+ feet flood bores roaring down Wadi Mudhlim, rushing into Wadi Mataha and then into the confluence with Wadi Musa. At the Nymphaeum at the confluence, it is speculated that it meandered violently down the road from the Nymphaeum to the Street Shops, Temenos Gate, to rush past Qasr al-Bint and down Wadi Siyagh toward the Wadi Araba. The floodwaters would have left large boulders up to 1-2m (3-6') in diameter, strewn along its path.

The intent of this paper is to examine varied evidence of catastrophic flooding in Petra, and to elaborate on these distinctive observations, in conjunction with fluvial calculations, measurements, and discussion conventional in arid-land, fluvial geomorphological research today (Graf 2002), and how it relates to the probability of a catastrophic flood in Petra.

Evidence and Observations

The work of geomorphologists (physical geographers, and geologists) has been likened to 'gumshoes in natural settings' where empirical clues of past and present environments are recorded, measured, compiled, and integrated to better understand surficial processes and their rates, now and then (Mackinder 1887). Without written records or documentation in Petra of a disastrous flood, circumstantial and direct evidence is needed to reconstruct the occurrence of such a catastrophe devastating the City and/or the region. One of the underlying principles of the natural and social sciences is that natural process *rates* may change (i.e. climatic, fluvial, pluvial), but their influences and mechanisms rarely do. This concept of 'uniformitarianism' is a fundamental principle in fields that utilize *scientific methodology* today (Leopold *et al.* 1995).

In Petra, since investigating natural and anthropogenic influences responsible for architectural deterioration over the past twenty years (Paradise 1995, 2005, 2010, 2013), field evidence indicated that the city center was inundated by high floodwaters that roared through Petra via Wadi al-Madras, the hewn Tunnel at Bab as-Siq, Siq al-Muthlim, and finally Wadi Mataha. It entered Wadi Musa at its confluence at the Nymphaeum, to flood the Colonnaded Street, rushing down Wasi Musa to drain into the gorges of Wadi Siyagh to Wadi Araba (figure 1, 2). These clues that lead to the speculation of a devastating flood include (a) channel configurations that exacerbated the high-water condition for a rushing catastrophic flood, (b) pockets of remnant sediments found suspended high above current wadi channels, or in excavations of alluvium contemporary to the flood, and (c) the observation and distribution of missing pavers along the Colonnaded Road.

Channel Configurations

In Petra, to better understand the open channel flow, hydraulic power of the water in the wadis, and the overall rheology, a number of channel profiles were measured and analyzed. Fourteen channel cross-sections were made from the confluence of Wadi Mudhlim with Wadi Mataha, downstream along the reach of Mataha to its confluence with Wadi Musa (at the Nymphaeum). Using *Trimble Juno* GPS devices, *Abney* and laser levels, measuring tapes, laser measuring devices, and digital photography, the channel shapes and dimensions were diagrammed to hectometer accuracy ($\pm 5\text{cm}$) (figures 2, 3). These channel shapes and measurements were used in Manning's equation calculations to analyze channel flow regimes at varied flood heights, along the wadi reaches. Water depths were determined by measuring the heights of relict alluvial remnants along the wadi. Calculations were then made to determine high-flow stage and velocities associated with that channel morphology. Ideally, the ages of this sediment deposition should have been ascertained as contemporaneous, however, it would have been cost and time-prohibitive to locate organic components for radio-carbon dating, or through absolute dating procedures as optically stimulated luminescence (OSL) (Prescott & Robertson 1997). Hence, the greatest height above the channel *thalweg* (deepest portion of channel) was

determined from the remnant alluvia and/or fluvially eroded features, prevalent throughout Siq Mudhlim and the narrow channel near the Wadi Mataha-Musa confluence. These heights (m) were used in flood stage and velocity determinations (figures 3, 4). The results supported speculation that high flow velocities and stage was probable in these confined channels and slickrock banks in this arid landscape.

Through the implementation of the Manning's Equation(s) (Leopold *et al.* 1995), calculations supported the intuitive notion that as water in Wadi Mataha moved downstream, and the channels narrowed in width, it forced water to deepen and increase in velocity.. To confirm this observation, alluvium was found located above the channel as the water flowed from its upper confluence with Wadi Mudhlim to its merging with Wadi Musa (figure 3). If we speculate that the water source was supplied mostly from upstream sources (from Elgee, then Bab as-Siq as stream input and/or precipitation), we can estimate that the channel discharge (volume/time) remained relatively constant or as moderately increasing. If this was the case, the water in the channel would have risen dramatically due to channel narrowing, and increasing in velocity; this was confirmed through the Manning's calculations (Barnes 1967). Velocity was determined to double from 0.2-0.4 meters per second (0.7 to 1.5kph) at the upper reaches (cross sections A,B,C), to 0.4-1.0 meters per second (1.4 to 3.6kph) along the lower reaches as it neared Wadi Musa (cross section F,G,H).

This increase in velocity would have occurred in tandem with an increase in water depth, raising water levels three to four times. With a channel width nearly four times wider at A (at Mudhlim), versus H (near the Nymphaeum), it is verifiable and intuitive that a high to severe flood stage would breach the wadi wall at the Nymphaeum. A catastrophic flood event would not only top the channel bank, but would overrun the Colonnaded Road's flanking structures: the Street Shops, the propylaea at the Pool Complex and Great Temple, South Portico, Temenos Gate, and onto the Qasr al-Bint. It may have been deep enough to flood the *plaza* area of the Pool Complex as well. The flat area that we now see and walk along the lower portion of Wadi Musa (near the restaurants, museum and restrooms) would have been inundated with 2-3 meters of floodwaters, and

up to 5 meters of rushing water (based on Chezy, Manning models: Limerinos 1970).

These fast currents would have created turbulence so great that it would have eroded road pavers and removed most road substrates, currently evidenced by the missing pavement stones (figures 1, 5, 6, 7). It would have also redistributed significant amounts of alluvium from the upstream sediment reservoirs in channels, sandbars, and adjacent dunes, into the downstream channels and floodplains creating a lateral and distal deposition of sands, silts, and clays, to the vertical and graded relocation of clay, sand, gravel, pebbles, and boulders (figures 1, 6, 7). This lateral and significant accretion was evident in the lighter-colored Disi alluvium excavated throughout the Roman Street shops discussed later (Fiema 1998).

Missing Street Pavement

The most ubiquitous, and overlooked evidence of a catastrophic flood in Petra may lie beneath our feet. Aerial imagery and on-the-ground observation show huge areas of limestone pavers are missing from the surface of the Colonnaded Road from the Nymphaeum, past the South Portico, through the Temenos Gate, to Qasr al-Bint. The missing paving stones are not randomly missing (or stolen) but the voids represent patterns of floodwater meanders. These arcing lacuna undulate in configurations similar to a meandering stream channel, and in these repeated oscillations further indicate fluvial influence. The longest reach of missing pavers occurs at the confluence of Wadi Musa and Mataha, decreasing downstream along the paved street flanking. The missing pavers decrease towards the colonnade, completely missing again near the Temenos Gate and South Portico (figures 1, 5, 6, 7). So why do the missing Colonnaded Street pavers exhibits a pattern, and not an arbitrary arrangement of missing and extent pavement stones? The proximity of the missing pavers adjacent to the wadi channel, and the characteristic arcing configuration all indicate that their removal was a function of fluvially-generated turbulence – a regular result of the violent power of high floodwaters, exceeding channels that are irregularly-shaped, slickrock, and confined, like those of Petra's wadis.

Relict Alluvium

Floodwaters cause a characteristic redistribution of varied sediment materials in distinctive patterns and layers. During these high water events the fluvial relocation of upstream sediments and alluvium into the downstream environments creates both vertical (from extreme water depths) and horizontal layers (from increased lateral distribution). These characteristic flood deposits can be observed throughout Petra's city center flanking Wadi Musa, as well as in records and diagrams from early excavations along and atop the Colonnaded Road (Parr 1960).

The white-buff colored Disi Sandstone and Formation sits atop Petra's iconic Umm Ishrin red rock 'half as old as time', and is easily observed across the region as the light-colored rock that comprises most of Jebel Khubtha, the Djinn Blocks, and rounded rockforms surrounding Bab as-Siq. Their buff coloring marks a sharp contrast to Petra's lower reddish rocks of the Umm Ishrin Formation: dark-red, mustard, magenta, and brown tones made famous in J. W. Burgon's award-winning poem as 'rose-red'. It is the alluvium from the Disi Sandstone that are observed as pockets across the valley of Petra, mobilized above Wadi Mudhlim, then transported into Wadi Mataha, and ultimately into Wadi Musa in Petra's city center.

Both Burckhardt (1822) and Robinson (1930) described the wadi and channel to the north of the Siq (through the Tunnel and into Wadi Mudhlim) was the primary channel for diversion, created by Nabataean and/or Roman engineers. Since the Siq has been the City's main entry for 2,000 years, diverting potential floodwaters from entering the Siq was crucial to trade, urban life, and travel. Rising waters draining from Elgee through Bab as-Siq, towards the Siq were diverted through the tunnel. This drainage ultimately merged downstream with Wadi Musa at the Nymphaeum. However if and when the culvert and weir failed at the entrance to the Siq, the rushing water would have (and indeed has) rushed into and down the Siq. This was the case in 1963, when 22-25 visitors died from flash flooding (accounts vary). The water depths in the Siq were described as 4-5m (13'-16') (Chicago Tribune 1963), yet the Khazneh was spared great damage, and the floodwaters drained into the Outer Siq. After the disaster engineers decided to build dams, weirs, and culverts to mitigate against any flood

recurrence, however they unearthed classical period structures (Nabataean?) that were used exactly for that purpose: to divert floodwaters from Wadi Musa into Wadi Mudhlim at the Siq's entrance; these flood abatement structures were then reconstructed.

It is estimated that the rushing water exceeded 4-5m and would have devastated central Petra. However, these narrow slickrock wadis would have been forced the water to accelerate, increasing turbulence especially in confined spaces like the Tunnel. It is speculated that water would have been diverted from entering the Siq, entering the Tunnel to create a 'hydraulic head' where the water would have backed-up, raising water levels behind the Tunnel opening, and subsequently top and flow over the carved channel and tunnel. In slow-water areas, sediments would have been deposited, and in areas of fast-moving water, scouring from erosion would have occurred along its sides (figure 8). Along Wadi Mataha today, similar deposition is observed in areas of slower velocity upstream (broad, gravel-filled channels), and erosion and scouring is observed in areas of high velocity flow downstream (narrow slickrock channels) (figures 2, 3, 4).

Pockets of Disi-derived alluvium can be observed along the banks of Wadi Musa in the main valley, indicating that these sediments were transported from upper Wadi Musa above the Siq where the Disi outcrops at the Bab as-Siq. At 3-6m above the channel thalweg, alluvium is observed across from the Roman Street Shops and Nymphaeum, and below the Byzantine Church and Temple of the Winged Lions (figures 1, 5, 6). More importantly, the Disi sandstone alluvium was discovered during the excavations of Fiema (1998) and Parr (1960, 1983). During the excavations of the Street Shops (#40-38), the buff-colored and undisturbed beds were found in Rooms XXVII-XXX. These were analyzed and assessed by the author for the archaeological team in 1997. Fiema describes them as 'uncleared sandy deposits' at the colonnade fronting rooms XXV and XXVI, and measured 0.15 to 0.25m in depth, facing the wadi channel, decreasing in thickness with distance from the thalweg. The alluvial color, composition, graded structure, and particle distribution indicates that they were deposited through the bank-full flooding and fluvial deposition from the adjacent wadi (to the north), and derived from the Disi Sandstone upstream and beyond the

confluence of Wadi Mataha and Wadi Musa (figure 9). During the excavation (1998), analyses of these non-occupation beds were conducted for particle size, type and distribution, graded structure, and color. Fiema identified the various locations of the sand-silt deposits with the assessment by the author in 1997:

“Two columns are located in that gallery, standing directly against the north face of Wall BB... with the bases of these columns being under the uncleared sandy deposits. It appears the columns are in situ. (411)

“A layered deposit of sand and coarse clayish-silt, ca. 0.15-28m deep... characteristic of flood event morphology, contained four coins... pre-AD 363 period. This layer was covered by a very heterogenous layer of silt with an abundance of cultural material (57 coins, 13 post 363AD issue). It is possible that the final occupation (was) before the flood... but might have happened sometime in the early to mid-fifth century AD... followed by the collapse of the arches. On the other hand, it is possible that the coins belong to two completely separate phases of occupation, isolated from each other both spatially and temporally by the flooding incident. (413)

“... in the adjacent room, the alluvial, flood-related sand and gravel was found deposited directly over the beaten-earth floor. Out of the 44 coins, 14 were minted after AD 363. (416)

“...the alluvial character of the lowermost deposits is common everywhere within the excavated area.” (417)

“Traces of the ancient meandering of the wadi banks were noted in Room XXVII. Post-earthquake (May 363) occupation, possibly interrupted by a flood episode, continued until the mid-fifth century AD. (418)”

Not only did Fiema's references determined the depth, extent, and locations of the relocated Disi sands, but when sondage was examined, Fiema and the author observed the arcing nature of the deposits (in Room XXVII). This alluvium morphology indicated their origin as the outside arc of an 'ancient meander' (1998). Moreover, the term 'episodic' has been used to in the past to describe

floods recurrence in Petra, however, when a dryland flood creates a 3-5m over-bankfull rush of water in a relatively small wadi (like Mataha), this would not be a seasonal or 'episodic' event, but one truly deemed as severe or catastrophic (Leopold *et al.* 1995).

When looking at annual flood stages in Petra, and talking with local residents, a flood bore of 3-5+ meters (13' to 16'+) is unique, and beforehand unobserved in the region. In these channels of this size and morphology, such a flood would represent a disaster of epic proportions – a 1000 to 2000+ year event.

When assessing paleo-floods, the calculations implemented for flood morphology, and stream velocity is determined by examining slope, meander size, and fluvial constants. Hence, based on Chezy and Darcy-Weisbach calculations (Bjerklie 2007), flood-level velocities that produce a broad meander such as what we see along Wadi Musa (45-50m wavelength) would rush at 3.0-3.3m/s, or three times greater than what would be considered a severe or catastrophic flood (Kleinhans & Van der Berg 2010) (figures 4, 5). The flood that produced the meander deposits excavated in the Roman Street Shops was not episodic or high, but one that was catastrophic in Petra, and would have dramatically affected its landscape. The turbulence would have removed many of Petra's limestone street pavers, before decreasing the floodwater velocity and depth. As the floodwaters slowed down, it would have deposited its bedload of boulders, gravel, sand, silt, and clay -- from the beige Disi Sandstone above, and the reddish Umm Ishrin Sandstone below.

What creates new questions is why were the deposits found in the Street Shops composed only of the Disi sands, and not a combination of Disi and Umm Ishrin sands? Such a wall of rushing water would entrain and transport bed materials as it rushes down the wadis. So, why are the excavated sandy beds comprised with what appears to be only the light-colored Disi sands from upstream? One answer seems clear; the first flood bore was filled with suspended Disi sands. The flood velocities in Wadi Mataha were calculated to range from 0.7-1.0+m/s (figure 4) and would have been ideal for the entrainment and transportation of sand. Once the flood bore rushed from Wadi Mataha to merge with Wadi Musa at the Nymphaeum, the increasing velocity (~3m/s) would mobilized boulders one meter or more in diameter (Leopold *et al* 1995), in addition to the destruction

sustained from sediments filled with grit, pebble, and boulder-filled water. Therefore, it is speculated that the first floodwave was filled with entrained Disi sands, rushing down Wadi Mataha dropping its bedload abruptly at the walls of the Street shops as it jumped the Nymphaeum and main street (figures 5, 9). The sharp decrease in velocity would have been sufficient to cause the turbulent, fast floodwaters to drop its sediments (shops XXVII-XXX).

In Parr's notable excavation (1983) of the Colonnaded Road at the South Portico and Temenos Gate, cross-sections clearly showed the particle distribution of fluvial deposition. Not only do these sediments indicate typical lateral and vertical flood deposits, but they also exhibit a distance decrease from the wadi, thinning in thickness with distance from the current thalweg (figures 10, 11). This supports the hypothesis that these were Disi sands transported by floodwaters to be deposited along the Colonnaded Road at depths up to 2-4m above the paved surface, and 4-7m above the channel thalweg. The distance from the wadi thalweg also matches those of the deposits unearthed in Rooms XXX-XXVII. This corroborates calculations that suggest the water was rushing, turbulent, and fast-moving upon exiting the narrows at the confluence of Wadi Mataha into Wadi Musa. Such a swift bore would have topped the bare sandstone facing the Nymphaeum to jump onto the roadway rushing into broad meanders moving down the wadi channel curving from the South Portico to the valley wall and back until it drained into Wadi Siyagh.

The thickest portion of the cross section alone represented a minimum height of 3-4 meters above the road pavement (Parr 1983), and 5-6m (16-20') above the adjacent wadi thalweg. Flood alluvia only represent the lower water levels possible, so 6m sediment depths would mean at least 6m of water depth. This field evidence with paleo-flood reconstruction would indicate that Petra's city center would have been inundated for hours, only to recede leaving behind 4-6m of clay, gravel, sand and boulders strewn across lower Petra. What would have followed would have been the monumental task of removing the sediment, cleaning the city center, and then 'kick-starting' Petra's economy and order following the deaths, injuries, and damages sustained from such natural catastrophe.

Summary

Clues and evidence for a catastrophic flood in Petra can be found across the valley and surrounding area. Missing pavers along the Colonnaded Road, distinctive channel configurations along Wadi Mataha, alluvia of Disi-derived sediments along Wadi Musa (in situ and in excavations), and, all represent robust evidence and indications. Using conventional paleo-flood reconstruction techniques (i.e. Mannings, Chezy), in tandem with the analysis of relict and extant geomorphic features in Wadi Mudhlim, Mataha and Musa, reconstructions of discharge, flood wave height, velocity, and meander dimension (amplitude, magnitude) enabled the re-creation of a catastrophic flood(s) in the late Roman-early Byzantine history of the region (Leopold et al 1995). Suggestions of *periodic* and *episodic* flooding in the region are commonplace but represents a probabilistic recurrence frequency of 1%-10% ($P: 0.1-0.01$), however flood that were catastrophic in depth, velocity and turbulence ($p: 0.005-0.0005$), are not found in prior research or records, until today. It is hoped that this research will stimulate new discussions on the probability of a significant and historic flood. The evidence of the occurrence of undisturbed, buff to yellow-colored silt-sandy deposits unearthed in areas that indicate a 4th to 6th Century deposition creates questions of the possibility of a catastrophic flood. Moreover, these sandy lenses and layers found in Roman Street Shops excavations (Fiema 1998) and those of unearthed at the Temenos Gate (Parr 1960) indicate significant deposition(s) after the Great Earthquake of May 19, 363AD, up until the mid 5th Century (363-450AD).

In this paleo-flood reconstruction, the floodwaters would have accumulated upstream above the Bab as-Siq at the confluence of the channels draining the bowl-like watershed of Elgee (Wadi Musa today) due to torrential rainfall (and if in winter, it could have been possibly augmented by rapid snowmelt). Wadi discharge would have joined the main channel(s) to enter the Bab as-Siq at levels up to 4 to 6 meters in depth (13'-19'). Water would have created a torrent that would have entered the Siq, but found the northern channels of Wadi Mudhlim and the Roman Tunnel diversion more suitable for flow. If the channel of Wadi Mudhlim 1500-2000 years ago was similar to today's channel load and configuration, its relatively sediment-free, slickrock channel was ideal for

increasing the accumulating floodwaters. As the water rushed down Wadi Mataha, it would have accelerated from 0.5m/s to 1.1m/s, to jump the confluence at Wadi Musa at the Nymphaeum, to spread across the Colonnaded Street. Based on conventional analysis, the rushing waters poured across and down Petra's mainstreet accelerating to 3.3m/s. This increase in floodwater velocity would have been due to the merging waters rushing through the Siq, into the Outer Siq, and into the primary channel of Wadi Musa near the Theater. The fast waters from Wadi Mataha would have been laden with Disi sands, silt, and gravel, merging with torrents flowing through the Siq, now choked with the beige, yellow, brown, and reddish sands of Petra's lower sandstones. The floodwaters would have reached 5 to 8m (16'-26') in height, and created 50 meter-wide meanders across Petra's main street, civic center, and valley. The draining water zig-zagged down the Colonnaded Road leaving boulders, and heaps of gravel and pebbles along its path. Petra's main street would have been blanketed with 2 to 4+ meters of clay and silt (6'-13'), jumbled with boulders and gravel at first, then grading upward and laterally into beds of finer particles of sand, silt, and clay as the floodwaters receded.

Daily activities would have come to a standstill. Injuries and destruction would have been prevalent, and depending on the time of day, deaths could have resulted. The observed and analyzed evidence supporting a catastrophic paleo-flood in Petra is clearly connected, however, to better hone the date of occurrence of the occurrence may be divulged in future excavations, or undiscovered in past research, reports, or observations. So, why this megaflood does not appear in historic records remains a mystery, unless it occurred in conjunction with the great earthquake (363AD), or occurred so close in time, that it was lost in the blur of devastation. Dams, weirs, and flood diversion structures (Bellwald 2007) may have been so razed that the community had no means to protect itself from desert downpours. The flood may have occurred within months following the May quake devastation. It would have taken years for Petra to recover from this earthquake, so a torrential downpour occurring the following winter or spring (364AD), or in the decades to follow, is not out of the question.

The significance and value of interdisciplinary research here is obvious; the need to link findings from archaeological excavations, historic research, geographic geomatic work (cartography, remote sensing, and GIS), altogether with geomorphological training and observation is crucial in Petra and elsewhere. This research represents a beginning from which more excavations, field research, observation, and reassessment of prior work may yield and divulge greater clarity on this probable disaster – a first step in understanding the probability of Petra Great Flood between 363 and 450AD. We may need to collaborate, dig deeper, broaden our perspectives, and open our minds to the probability of such a historic and catastrophic event in the history of Petra. Maybe George Bernard Shaw said it best when he wrote “*Science never solves a problem without creating ten more.*” (1935)

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Related information used in research calculations –

1. Manning's Roughness coefficient: gravel-small boulders: 0.030-0.035
2. Slope along the Colonnaded Road: 2.036°, 0.0355
3. Slope along the lower reach of Wadi Musa to Wadi Mataha: 0.982°, 0.01714
4. Slope along the upper reach of Wadi Mataha to Wadi Mudhlim: 1.963°, 0.03428
5. Acceleration due to gravity: 9.8m/sec²

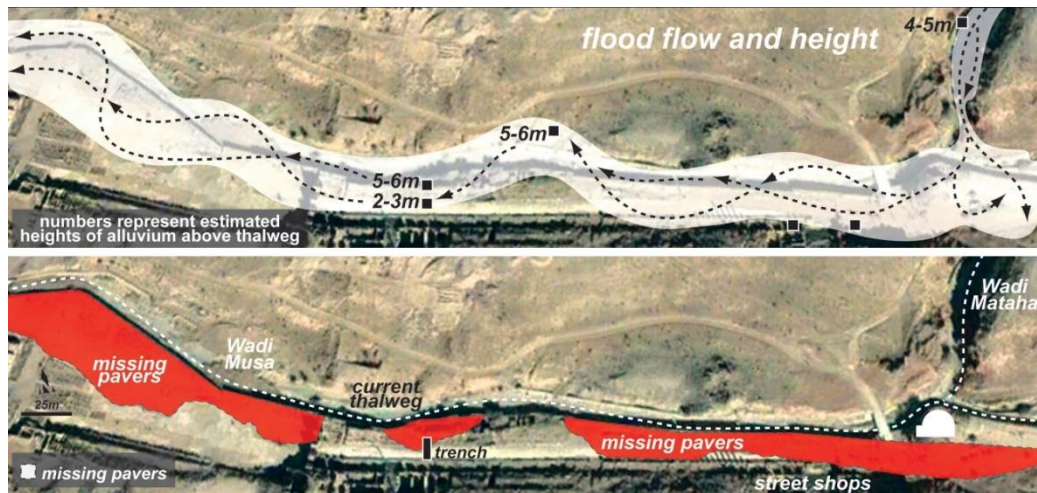


Figure 1: Aerial imagery of Wadi Musa from its confluence with Wadi Mataha and its drainage into Wadi Siyagh. This diptych represents duplicate images illustrating the speculated catastrophic flood regime (6-8 meter stages) in the upper image, and the relict alluvium heights noted above the channel thalweg. The lower image illustrates the area of (i) missing pavers, (ii) alluvium trench (Parr 1983), the location of the excavated street shops (Fiema 1998), and the current channel of Wadi Musa.

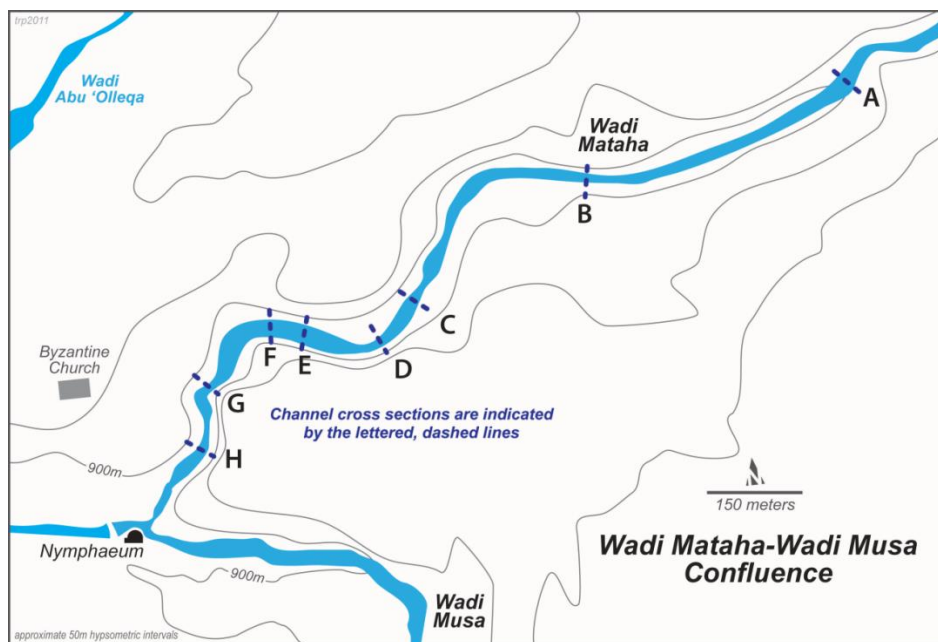


Figure 2: This map represents the extent and configuration of the wadi channels and confluence of Wadi Mataha and Wadi Musa. The confluence is marked by the Nymphaeum (c. 1st Century AD), where the wadi drains to the west. Wadi Mataha originates with the primary discharge diverted by the barrier culvert and 'Roman Tunnel. At the Bab as-Siq into Wadi Mudthlim, where it will subsequently converge with Wadi Mataha to the east of Jubel Khubtha.

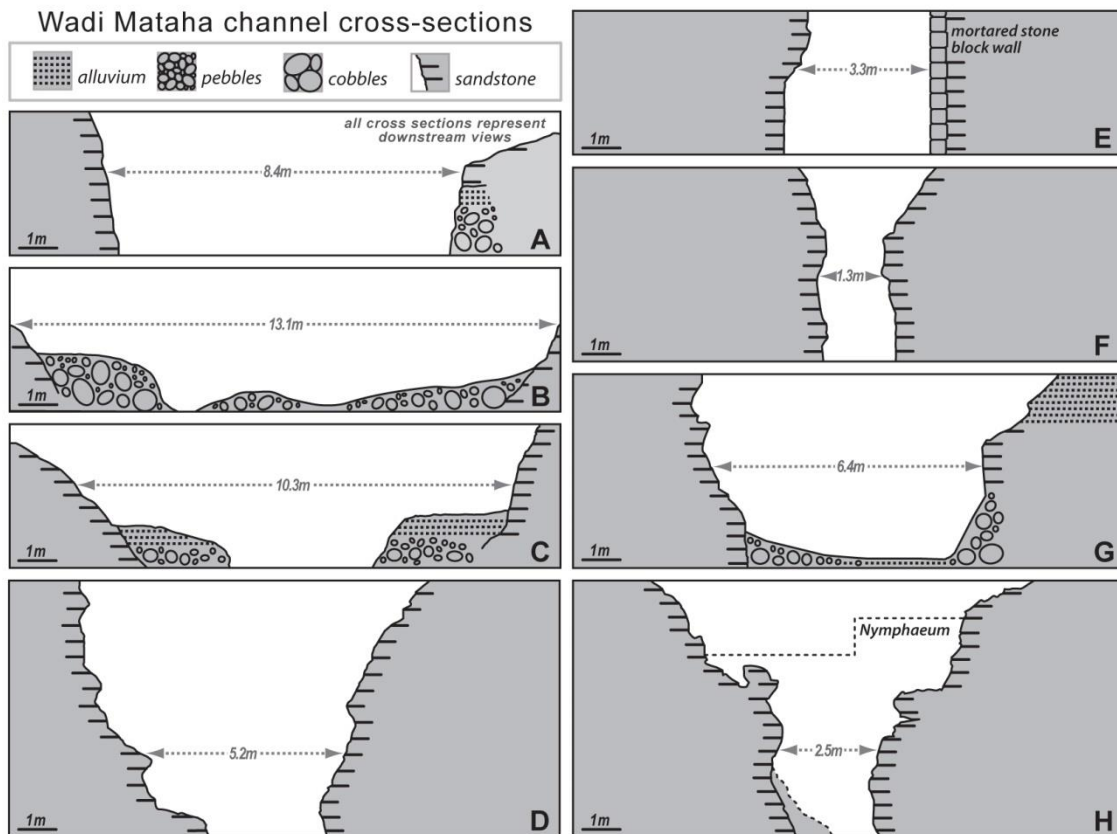


Figure 3: this multiple diagram represents the changing channel configurations between the upper reaches of Wadi Mataha near the opening of Siq al-Mudhlim (A), down the wadi and passing below Dorotheo's House, Sextius Florentinus, and the Royal Tombs. Wadi Mataha enters a small 'siq' as it approaches the confluence with Wadi Musa (H) directly below the Nymphaeum along the Colonnaded Street. Flood stages must have exceeded 6 to 7m to jump the Nymphaeum and flow across the Colonnaded Street (then and now). An additional 1-2 meters of flood stage (for a total of 7 to 9m) was required to reach and deposit the 0.2 to 0.8m alluvial beds found in (i) the Roman Street Shops (Fiema 1998), (ii) the excavated trench at the Temenos (Parr 1960), and (iii) the remnant sediments and abrasion observed along Wadis Mataha, Musa and Mudhlim.

Note that the Wadi Mataha channel narrows as it nears its confluence with Wadi Musa. Also, fewer channel sediments are observed farther down the channel; the 'wetted perimeter' becomes increasingly slickrock and bare sandstone. This geomorphic constriction facilitates high flood risk by creating a 'hydraulic head' whereby water levels rise as discharge remains constant or increases (Graf 2002).

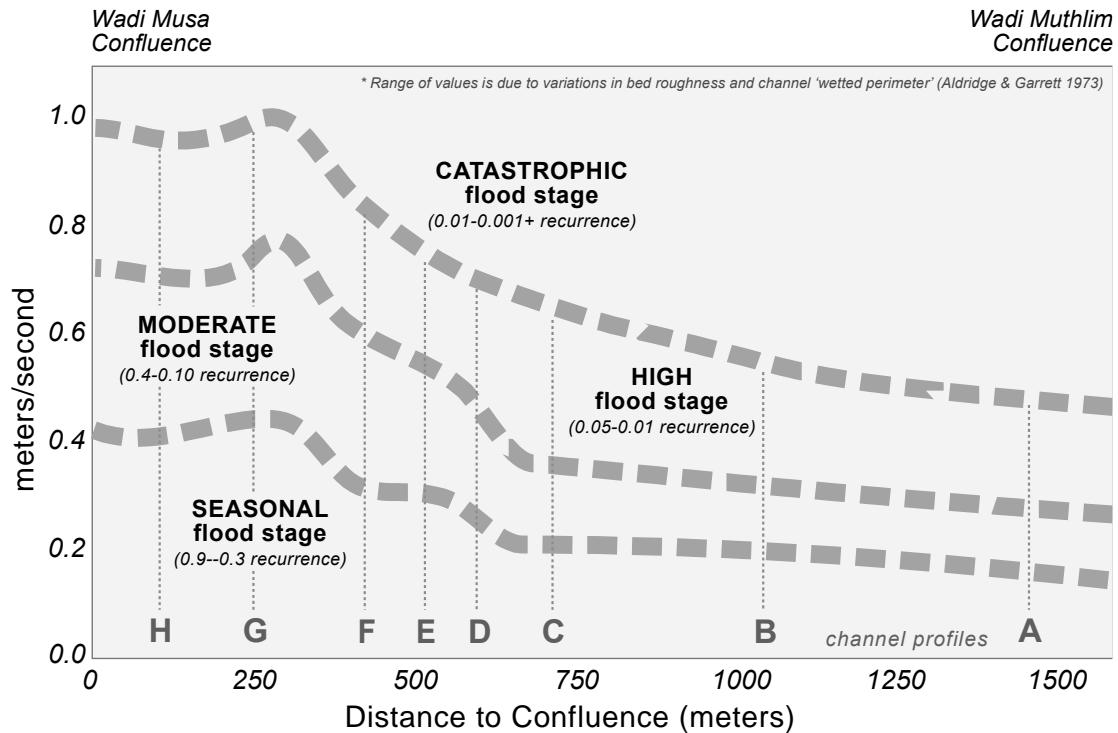


Figure 4: Manning's Equation (Leopold et al. 1995) is a conventional tool used in the calculation of stream velocity and flood levels; these were used in estimating flood stages in Petra's past. Using channel configurations, slope, and bed roughness it was estimated that water draining from Bab as-Siq through the Tunnel, into Wadi and Siq Mudhlim, and into Wadi Mataha accelerated as it reached the confluence of Wadi Musa and Wadi Mataha due to the narrowing of channel, channel wall changes from loose sand and gravel to slickrock, and a relative straightening of the channel reach. These graphs indicate that during various flood stages, the water not only increased in velocity two to three times (from 0.4 to 0.9 meters per second), but also doubled in height above the thalweg (3-5 meters) in moderate to high flood stages, but also trebled (6-9 meters) in those rare catastrophic flood events – having a flood recurrence interval of 500 to 1000 years (0.005- 0.001). Moreover, meander wavelength reconstruction from the Street Shops (Fiema 1998) indicates that the floodwater velocity exiting Wadi Mataha would have trebled again to 3.0-3.3m/s; this would create destruction and havoc along the Colonnaded Road with up to 18-25 feet of water rushing down through Petra as it entered at the confluence of Wadi Musa with Wadi Mataha.



Figure 5: This map represents the Colonnaded Street shops excavated through the American Center of Oriental Research (ACOR) under the supervision of Dr Z. Fiema (1998). In the main room excavations of XXX – XXVII, sandy, silt and clay deposits were excavated that are characteristic of the alluvium from the weathered Disi Sandstones above Petra at Bab as-Siq, Jebel Khubtha, and Wadi Muthlim. These alluvial deposits indicate their water-borne redistribution from catastrophic flooding through Wadi Mudhim into Wadi Mataha, to merge at its confluence with Wadi Musa. Note how the arcing nature of the deposits and the missing street pavers represents the arc of a large meander. Such large amplitudes for meanders are common in high-flood regimes such as these wadi channels.



Figure 6: Photograph looking west along the Colonnaded Road from the Nymphaeum to the Temenos Gate in Petra's City Center. The limestone pavers are missing between the excavated Street Shops (gated entries) and the wadi edge (far right). However, the pavers are visible in situ farther down the street towards the Temenos Gate (and trenched area of flood alluvium from Parr 1960). The arcing form of the missing pavement follows a shape typical of a stream or wadi meander. The larger meander amplitude (meander width) suggests a dramatic increase in stream discharge, significantly greater than seasonal or episodic flooding.

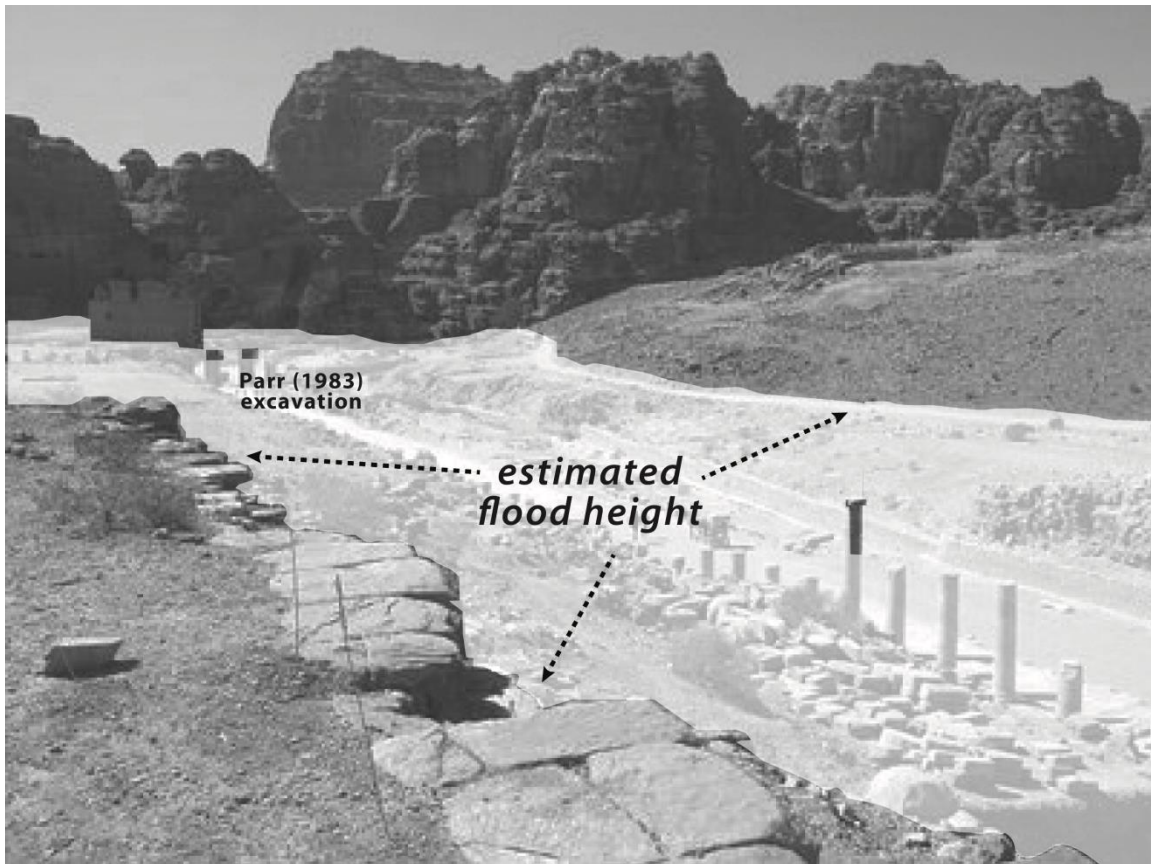
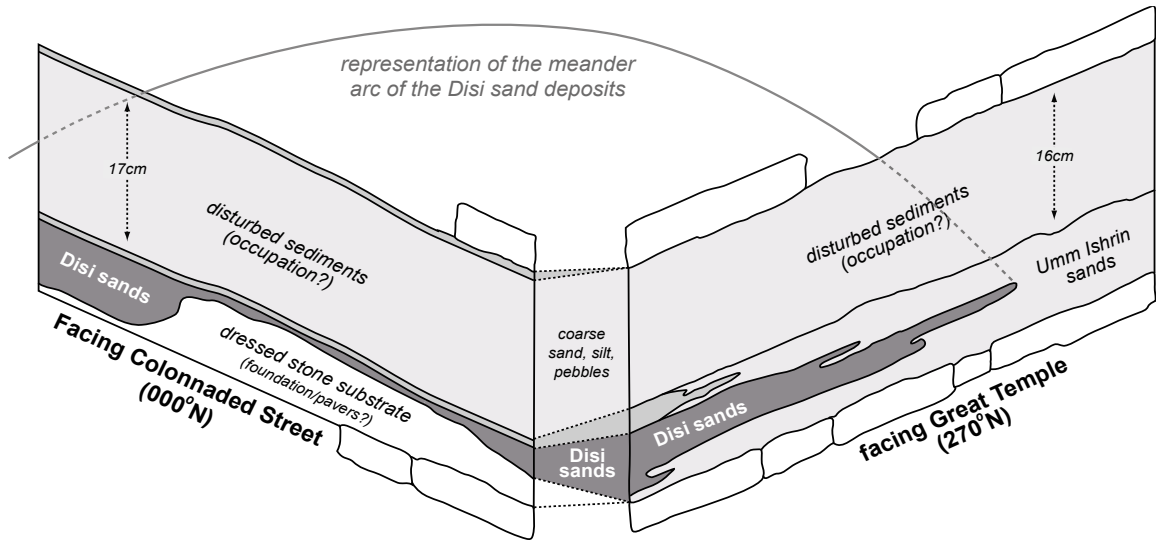


Figure 7: Looking west and downstream along the Colonnaded Road and the channel and thalweg of Wadi Musa, the height of the alluvial sediments on both sides of the channel are roughly 2 to 4 meters above the road pavement, or 4-6m above the channel thalweg. These relict alluvia and meander amplitude and magnitude dimensions, in conjunction with conventional flood analyses estimate flood levels >6m as illustrated here (Leopold et al. 1995).



Figure 8: Looking towards the hewn Roman Tunnel at the confluence of Wadi Musa and Wadi Mudhlim, in the Bab as-Siq (Tunnel is beyond the shadows in the channel), remnant patches of fluvial deposition and erosion created by high water events are visible. Discharge this great, and water stages this high represent a catastrophic event and not a seasonal or episodic flood stage. The height of both the scoured area and alluvium are the same at approximately 7-9m above the channel thalweg, indicating a flood stage similar in height to the event that created extensive deposition past the confluence of Wadi Mudhlim with Wadi Musa at the Nymphaeum. Also note the characteristic buff-color of the Disi Sandstone here, is markedly different from the dark reddish colors of the Umm Ishrin Sandstone in the Valley below.



Colonnaded Street Shop #30 cross section

Figure 9: These two cross section profiles represent two documented excavations at the Street Shop #30 along the Colonnaded Street. The left-hand profile was excavated facing the Colonnaded Street (~000°N), while the right-hand profile was found during a sondage excavation within the shop, extent aligned with the western wall (~270°N). Note the light-colored sands from the Disi Formation (from the Bab as-Siq) were unearthed here and can be found decreasing in extent with distance from the street and wadi channel. Their occurrence and distribution indicate a lateral and vertical deposition from Wadi Musa, via Wadi Mataha, via Wadi Mudhlim. Local deposition would consist primarily of the Umm Ishrin sandstone particles; a distinctive darker red color, rather than the lighter buff colors of the Disi. These profiles were measured, assessed, and documented by the author during the excavation field season (Fiema 1998).

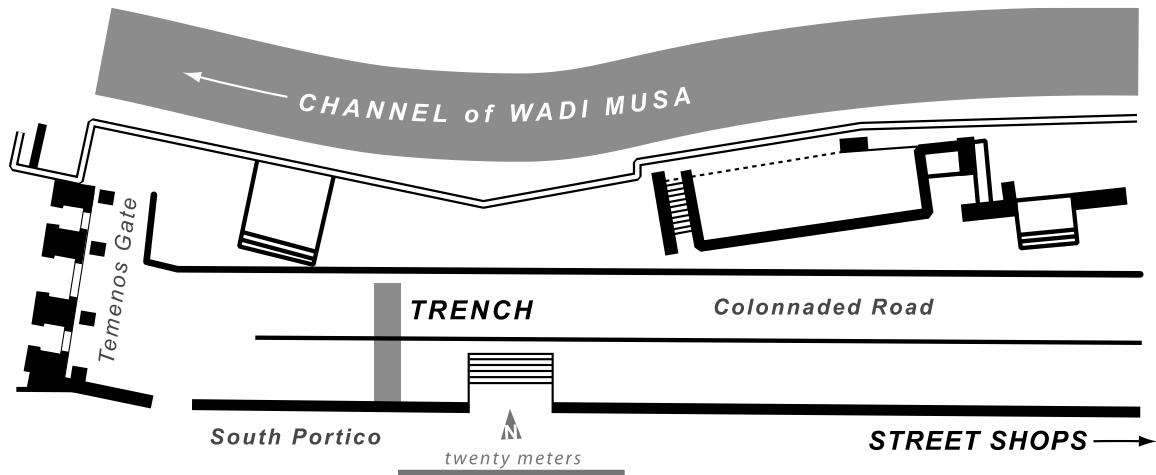


Figure 10: This map represents the location along the Colonnaded Road of the trench that exhibits the flood alluvium, excavated by Parr (1983). The configuration of the current bank, drainage geomorphology, and thalweg indicate that the current channel form and thalweg are the same or close to the channel form 1500 to 2100 years ago, however channel revetments and channel walls have been reconstructed and/or constructed in recent years. Note that the trench was located at the southern edge of the outside bend in the wadi meander – the area that would experience the greatest bank breach and out-of-bank deposition (both vertical and lateral accretion).

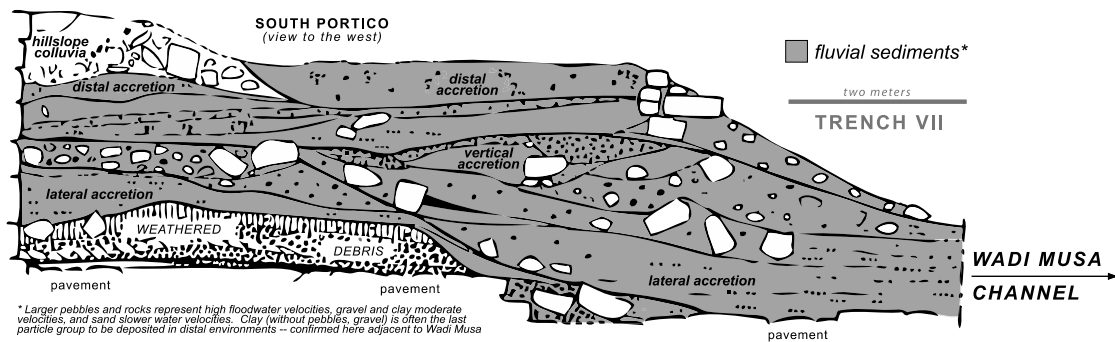


Figure 11: This map represents a cross section of the sediments excavated along the Colonnaded Road by Parr (1983). The indicated sediments are typical of fluvially-deposited sediments (alluvium) probably due to the flood event deposition along Wadi Musa, from drainage into the confluence via Wadi Mataha. This alluvium measures 3m (10') in depth atop the pavement, and 5m to 6m (16'-19') above the wadi thalweg (deepest part of channel). At a point where the current channel is 2 to 3m below the road, these sediments represent a flood stage of up to 6m or possibly up to 7m (19'-22') – a stage that matches fluvial sediments along Wadi Musa, its upstream confluence at the Nymphaeum, and the Wadi Mataha reach upstream.

Note that lenses of clays, silt and sand are interbedded with large boulders and gravel indicating a series of pulse of high velocity (2-3m/s) and low velocity water (<1m/s). Meander amplitude reconstruction from the Street Shop excavation (XXVII-XXX) indicates that the flood velocity was able to entrain and transport boulders 1-2m in diameter.

“THIS IS THE HOUSE THAT JACK BUILT”: IN WHAT SENSE ARE THE NABATAEAN TOMB INSCRIPTIONS LEGAL TEXTS?

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Abstract

*Nabataean law has attracted increasing interest in recent years, notably with the publication of Mahdi Alzoubi's thesis, *Les formules juridiques dans les inscriptions nabatéennes* (2012). It has long been recognized that the Nabataean tomb inscriptions contain legal language (see, for example, Healey 1993). What is less easy to determine is the precise genre of these unusual tomb inscriptions. This paper approaches the question on the basis of the linguistic formula used and through comparison with formulae in other Nabataean inscriptions and other ancient texts. It also presents the case against the idea that the tomb inscriptions are copies of legally constitutive texts kept in archives, arguing that the inscriptions are basically identification markers, containing selected legal details which are designed to warn against improper use of the tomb by persons who do not have rights in the tomb in question.*

Thanks are due to the organizers of the present conference for bringing me back to Wādī Mūsā. For subject matter I return to the Hegra tomb inscriptions twenty-five years after the publication of my book *Tomb Inscriptions of Mada'in Salih* in 1993. That book is complemented now by Laila Nehmé's splendid 2015 volumes. Here I want to discuss one of the “loose ends” which has never been thoroughly treated, or, to put it another way, which I have never properly thought through!

1. The Form of the Hegra Tomb Inscriptions

Tomb inscriptions of the ancient world come in a variety of forms: I will here largely limit myself to Aramaic and Greek tomb inscriptions roughly contemporary with the Nabataean texts in order to explore this variety of forms. I use the word “form” in this context. It is an echo of what in Biblical Studies has, since the early twentieth century, been called “Form Criticism” (German *Formgeschichte*). The basic concept is that longer texts are made up of units of a number of types or genres. In the simplest case in the Hebrew Bible, we have 150 psalms in the Book of Psalms, but they fall into a limited number of types: hymns praising God, lamentations about the effects of war, lamentations about sickness, etc. The different types or forms correspond to different functions in the life of the community — the German phrase is *Sitz im Leben*. In theory one might be able to see the historical development of particular forms by comparing early versions with later versions, demonstrating how new elements have crept in or old elements have fallen out (though this further step is much more difficult to achieve with confidence).

Tomb inscriptions are surprisingly varied, even within the sphere of Aramaic and Greek epigraphy. They are different again in Latin, Arabic and English.

We can begin by noting types of epitaph which exist and their obvious differences from each other:

1. Narrative-objective: “Wahballāhī made this tomb for himself and his family”.
2. Narrative-subjective: “I, Wahballāhī, made this tomb for myself and my family”.
3. Direct speech to the reader: “Look at this tomb, O traveller, and remember me, Wahballāhī”.
4. Deictic: “This is the tomb of Wahballāhī” or “... which Wahballāhī made”.

The first and second forms use a short narrative to record the ownership or origin of the tomb, but they are distinguished by whether they use objective language with the subject of the verb in the third person, or use subjective expressions in which the grammatical subject is first person. The third type is fairly common in the Greek and Roman worlds, but rare, so far as I can see, in the Middle Eastern context. The fourth is important for the discussion of Nabataean tomb inscriptions and I will give more explanation of it below.

Some very brief examples from different sources:¹

Type 1: Narrative-objective

The “Wahballāhī made this tomb for himself ...” type is found in Palmyrene: *mqbrt’ dh ‘bd ml’ br ... lh ... wlbwnwhy wlbnth wlbny bnwhy l’lm’*, “This tomb Male son of ... made this tomb for himself ... and for his sons and for his daughters and for his grandchildren forever” (PAT 2776). Both in this instance and in the Nabataean Bāb es-Sīq inscription, which provides another example, the word for tomb is “fronted”, i.e. placed at the beginning of the sentence for emphasis, defying the normal word order:

mqbr’ dnh bnh ‘bdmnkw br ... lnpšh w’hrh w’hrhm l’lm ...

This tomb ‘Abdmanku son of ... built for himself and for his descendants and their descendants forever (Nehmé MP 5; IGLJ IV, 54)

Type 2: Narrative-subjective

The “I, so-and-so, made this tomb” type is widely represented in early Syriac epigraphy:

’n’ ’ptwh’ br ... ‘bdt ly byt ‘lm’ hn’ ly wlbny wlyrty lywmt ‘lm’

I, Aftūhā son of ..., made for myself this tomb, for myself and for my sons and for my heirs to the days of eternity (Am2 in Drijvers and Healey 1999).

Type 3: Direct speech to the reader

This type is not, I think, represented in any of the branches of Aramaic of this period, but it is known in Greek. I quote an example from 1st century AD Leontopolis:

I am Jesus, my father was Phameis, passer-by. I went to Hades when I was sixty years old. Weep all together for the one who has suddenly gone to the secret place of eternity to dwell in darkness. And you, Dositheus, weep for me, for it is your duty to pour out libations of bitterest tears on my tomb....” (CIJ §1511; note also §392)

¹In all the inscriptions cited in this paper I have ignored minor restorations and doubts in readings which do not affect the consideration of the formal characteristics of the text.

Type 4 is the type I want to discuss in more detail in this paper. It essentially marks the tomb by using the demonstrative pronoun in a special type of sentence, using the “This is the tomb ...” formula. More fully we would have “This is the tomb which so-and-so made or built” or “which belongs to so-and-so”. I want to focus attention on the formula used: “This is the tomb which ...” and it is this phrase which reminded me of a nursery rhyme I learned in childhood: “This is the house that Jack built”. This is the first line of a long poem and it is often illustrated in children’s books by the picture of a house. The attentive parent reading the poem to the child *points* to the picture of a house.

The Nabataean phrase at the beginning of almost all the monumental tomb inscriptions on facades at Hegra is *dnh kpr’ dy ‘bd PN ...*, “This is the tomb which PN made ...” and the following verb is inside a subordinate clause, a relative clause. There are three tomb inscriptions in which the term used is not *kpr’* but *qbr’* (H7, H8, H33), but all other aspects are the same. We may also note that a similar syntactic structure is found in the interior tomb inscriptions (H2, H11, H13), where what is being referred to are not tombs but niches (*gwhy’*).

We may ask why the authors of such inscriptions did not say, more simply, as in Type 1, “So-and-so made this tomb” rather than “This is the tomb which so-and-so made”. This would be expressed perfectly clearly in Aramaic as *‘bd PN kpr’ dnh*. And we have seen this formula above in other inscriptions from Petra and Palmyra.

In fact the placing of “This is” at the beginning of the statement is a kind of linguistic fronting of the demonstrative pronoun, forming a sort of cleft sentence. In normal use the demonstratives refer to something which has already been mentioned in the text or is about to be mentioned (anaphoric or cataphoric). The fronting of the demonstrative in the cleft structure is used both in English and in Aramaic and other Semitic languages for the particular purpose of identifying something in the real world outside the text (exophoric).

In this kind of statement (“This is the tomb which so-and-so made”) we have what could be called “Gestural Deixis” (cf. Levinson 2005). This is in the context of what linguists call Pragmatics and in this case the speaker or writer is at the same time, in theory, making a gesture, pointing at the tomb. If you have a

puncture in a tyre on your car and you tell the mechanic “This is the tyre which needs repairing”, your statement will be meaningless unless it is accompanied by a gesture, i.e. unless you point at the tyre. There are four tyres and just *saying* “this tyre” is insufficient. You also need to point at it: gestural deixis.

Conceptually therefore, “This is the tomb ...” involves pointing to a particular structure. If it were uttered by a man standing outside the tomb, he would point to it and say “This is the tomb which Wahballāhī made ...”. The clarity of this kind of deixis is determined by the proximity of the object being referred to. By putting it in writing, and attaching it to the tomb itself, the author perpetuates the dramatic gesture and thereby confirms ownership permanently. Thus the formula in our tombs is essentially a declaration identifying the tomb as belonging to or having been founded by the named person or persons. “This tomb you see before you (in case you want to know) belongs (or belonged) to Wahballāhī”.

Now I turn to consider other similar Nabataean linguistic expressions and others in the Aramaic environment.

Firstly we may note that simple tomb inscriptions in Nabataean which say “This is the tomb of so-and-so” (full stop) are very rare (CIS II 159, 192; Littmann 34, 40; and cf. RES 1092). The majority have “This is the tomb which so-and-so made.” There are, however, many other sentences which occur which have the same sort of structure as the one we are considering, often referring not to tombs, but to images (“This is the image which Wahballāhī set up ...”) or altars of different types (“This is the altar/stele which Wahballāhī made ...”).

The list below has c. seventy epigraphic examples of this syntactic structure in Nabataean, approximately twenty of which are funerary (in addition to those from the monumental tombs of Hegra):²

Tomb-related

dnhnpš PN ... /npš' dy PN ... (CIS II 159, 192; Littmann 34, 40)

d' npš' dy 'bd ... / bnh ... (CIS II 194, 333; JS 386; RES 468; Littmann 39; Nehmé 2010: 1, 2, 4)

d' npš PN ... dy 'bd / 'qym ... (CIS II 195, 332; MP 7; al-Najem-Macdonald 2009)

²PN = Personal Name. Note that the entries in the list summarize on the basis of the form: details vary.

dnhqbṛ' dy bnh ... (CIS II 184; JS 17; Littmann 1; WR 16)

d' mqbṛt' wtrty npšt'dy PN ...dy 'bd ... (CIS II 196; Milik 1958: no. 6)

d' 'rn'dy 'bd ... (CIS II 173)

dnh'rkt' dy 'bd ... (RES 471, meaning of noun uncertain)

dnhbyṭ 'lm' dy whb'lhy ... dy hqymw (Negev 1971, giving the month and year of death!)

'lk šryhy' ... dy ... 'bd 'šlh (MP 3)

Not tomb-related

dnhmsgd' dy hqym / dy 'bd / dy qrb ... (CIS II 161, 176, 185 [verb *wqp* in asyndetic relative?], 218; Khairy 2000: no. 6; Milik 1958: no. 2; RES 83, 676, 2051, 2052 [see Milik 1958: 230])

d' mḥrmt'dy PN ... (Littmann 72)

d' mḥrmt' dy ḥdtw / dybnh / dy 'bd ... (CIS II 158; Savignac-Starcky 1957; Starcky 1985: 181; MP 17.4 [*dnh mḥrmt'...*]; Nehmé 2010: 5)

d' rb't' dy 'bd / dy bnh / dy qrb ... (CIS II 160; Jones et al. 1988; Littmann 71, 96; RES 482)

dnh'rb'n'dy 'bd ... (Littmann 2)

dnhšlm' dy 'qym(w) ... (CIS II 164)

dnhšlm' dy PNdy 'bdw / dy'qym ... (CIS II 349 [zy PN zy hqym?], 354; Starcky-Strugnell 1966: 236-44)

d' šlmt'dy PN ... (RES 1092, 1434: probably *d' šlmt' dy 'qymw ...*)

dnhmšb' dy bšr' dy 'bd ... (Milik 1958: no. 7)

dnhmḡmr dhn' wkpt kyš' dy qrbw ... (al-Salameen-Falahat 2014)

'lh try ḡmly'dy qrbw ... (CIS II 157)

dnhbyṭ' dy bnh ... (CIS II 182; Clermont-Ganneau 1919; Milik 1958: no. 1)

dnhgdr' dy ... wkwy' dy bnh ... (Littmann 69)

dnhbnyn' dy bnh ... (Littmann 28)

dnhḥmn' dy qrb / dy 'bd / dybnh ... (Littmann 97; RES 2053; Nehmé 2010 no. 3)

dnhtyṭr' dy qrb ... (Negev 1961: 128)

dnhskr' dy bn' ... (Negev 1961: 135; 1963: 113)

dnhmnrt' dy qrbt ... (al-Salameen-Shdaifat 2014)

’lh nšby ’l’z’ wmr’ byt’ ’bd ... (MP 617; possible asyndetic relative)

’lh qšry’ dy bnh ... (Starcky 1971: 151-9)

znh’tṛ’ dy ’bd ... (A. Cowley in Woolley-Lawrence 1915: 145-46)

dnhmškb’ dy ’hd ... (CIS II 234: meaning of noun uncertain [tomb?])

d’ dy ndr tymw ... (Littmann, p. 46: no noun, strange syntax)

dh ’bd ’bd’bdt ... (Littmann 42: no noun, but on a lintel)

We can see from this list that the thing on which the inscription is inscribed and the thing which is being pointed out (“This is ...”) can include, apart from tombs and parts of tombs, many other items related to cult: lamps, (figurines of) camels, sacred places, stelae, images, parts of buildings, etc. We are, therefore, dealing with a syntactical structure which is widely used in the identification of the owner or dedicator of both buildings and objects.

The typical situation in the use of demonstratives (i.e. in deixis) is that the demonstrative refers to something mentioned earlier in the text or something about to be mentioned in the text. For the latter we may note in the Aramaic section of the Book of Ezra a letter being sent to the Persian king Artaxerxes which is introduced as follows: “This is the reply to the letter they sent to him” (*dēnā paršegem ’iggartā dī š’laḥū ’alōhī*) (Ezra 4: 11). The situation is that the letter is about to be read out, so the demonstrative refers to something within the text.

And there are examples of this situation in the Nabataean papyri. In P. Yadin 2 and 3 the abutters or boundaries of the date-palm grove being sold are introduced as follows:

’lh tḥwmyh lmdnḥ’ ... wlm’rb’ ... wlymyn’ ... wlsm’l’ ...

These are its boundaries, to the east ..., and to the west ..., and to the south ..., and to the north ... (Yadin et al. 12012: P. Yadin 2: 4 and 3: 25)

Here the fronted demonstrative is immediately explained in what follows without any gestural accompaniment.

Much more like the situation of our tombs is that found within the Greek narrative of the crucifixion of Jesus. All four gospels report that a *titulus* inscription was placed on the Jesus’ cross (Matt. 21: 11 and Luke 23: 38; CIIP §15). Matthew tells us it said: “This is the prophet from Nazareth” (Οὗτος ἐστὶν ὁ

προφήτης Ἰησοῦς ὁ ἀπὸ Ναζαρέθ). Or in Luke “This is the king of the Jews” (Ὁ βασιλεὺς τῶν Ἰουδαίων οὗτος). Whatever about the historical reliability of the texts regarding the wording, it is clear that the word “This” refers neither to something or somebody referred to earlier in the narrative and not to something to be explained in a subsequent narrative, but simply to the person on the cross. In expanded form it means: “This man you see before you on this cross (in case you want to know) is the prophet Jesus....”

Beyond these literary contexts we may note that there is a fair amount of epigraphic material from the region with which we can make useful comparison. The recently published four-volume corpus of inscriptions from Palestine in this period (CIIP) contains relevant material in Hebrew, Aramaic (including Palmyrene Aramaic), Armenian, Latin and Greek. I will just give a few examples: CIIP §137 is the long-known Hebrew inscription from the Tomb of the Sons of Ḥēzīr of the 1st century CE from the Kidron Valley, contemporary with the Nabataean tomb texts:

zh qbr whnpš šl'l'zr ḥnyh ... bny ... bny ... khnym mbny ḥzyr

“This is the tomb and the memorial belonging to El‘azar, Ḥaniya ... the sons of ... the sons of ... priests from the family of Ḥēzīr” (see also in older collections such as Cooke 1903: 341-42).

CIIP §439 is in Palmyrene script and on an ossuary:

dh qwqh dy tymy br ... wbrh wbrth ...

“This is the *loculus* (= Nabataean *gwh*) of Tymy son of ... and his son and his daughter ...” (See also CIIP §460)

There are other funerary inscriptions in Greek from the Kidron Valley (CIIP §959) and other relevant tomb inscriptions from Jerusalem (CIIP §875: ἐνθάδεκεῖται; CIIP §888 etc.: θήκη διαφέρουσα; §892 etc. μνημα διαφέρουσα; see also CIIP §986 containing a curse and §2205 and §2214).

From nearby, a little later, we have the Jewish Aramaic tomb inscriptions of Byzantine date from Zoar, which had been part of the Nabataean kingdom before 106 AD, published recently by Meimaris and Kritikakou-Nikolaropoulou (2016). I will quote a single example (no. 1):

hdh npšh ddm̄tynh br ḥrth d'tknš šnt mtyn 80 wtr̄tyn šnyn lḥrbn byt mqđšh

“This is the tombstone of Domitianus son of Ḥareta, who was gathered (i.e. died) in the year two hundred and eighty-two of the destruction of the Temple” = AD 350/1).

These tombstones number over sixty and almost all are dated. They use the terms *napšā* and *maškbā* for the tomb itself or funerary memorial. The former is very common in Nabataean and the latter occurs in CIS II 234.

The so-called “Old Syriac” inscriptions provide another comparable corpus of Aramaic material. These are from Edessa in southern Turkey and date to the 1st to 3rd centuries AD. They overlap with the Nabataean inscriptions in date and show some common features, but perhaps the following summary will show that the two corpora are actually quite distinct.

So far as tombs are concerned, we may note several examples where Type 4 prevails. For example:

hn' bt qbwr' d'bd 'bdby br ...

“This is the tomb which ‘Abdbay son of ... made” (As56; see also As5, As24, As58, As10, Am5, all in Drijvers and Healey 1999)

The same formula, as in Nabataean, is used of various other objects, particularly images:

hn' šlm' d'bd m'nw br ... l'bgr šlyt' d'rb

“This is the image which Ma'nū son of ... made for Abgar, governor of ‘Arab”. (As51; see also As6, As23, As43, As47 (plural), As52, As61, Drijvers 1993)³

But there are also many examples, often in mosaics inside tomb chambers, which are expressed in the 1st person singular (Type 2), like:

'n' 'ptwḥ' br ... 'bdt ly byt 'lm' hn' ly wlbny wlyrty lywmt 'lm'

I, Aftūḥā son of ..., made this tomb for myself and for my sons and for my heirs to the days of eternity” (Am2; see also As9, Am1, Am2, Am3, Am6, Am7, Am8, Am9, Am10, Bs2 + Desreumaux 1999; Rumscheid 2013; Healey 2006)

³There are a few examples also from Dura Europos (Bertolino 2004: H.L7.20): *hdyn ktbt dy ktb mtny*. Also Hatra/Tur 'Abdin: Beyer 1998: T1: *hdn šlm' d...* and T3: *hd' prk' dy 'bd...*

None of the various parallels I have cited can be interpreted as legal texts in themselves and, although I have elsewhere strongly defended the legal character of the Hegra tomb inscriptions (Healey 2013), the use of the “This is the tomb which PN made ...” does not imply any legal status for the inscriptions concerned. To that legal status I now turn.

2. The Internal Structure of the Hegra Tomb Inscriptions

One of the unusual aspects of the Hegra corpus of tomb inscriptions is its coherence. We are presented with thirty-eight inscriptions from the same location, all related to tombs and all written within a fairly tight time-frame of seventy-five years, from 1 BC/AD to AD 75. In Aramaic epigraphy this is an unusual situation. For example, the corpus of Old Syriac inscriptions (including under this general term rock inscriptions, inscriptions in mosaic and texts on parchment), contains about 150 such inscriptions, but they extend in date from 6 AD to about 250 AD and, although quite a number of them are related to burials, there are only about twenty which can be claimed to be epitaphs.

The coherence of the Hegra corpus may be viewed negatively as repetitiousness: “They all say the same sort of thing!”. I am sure some have reacted in this way. But the coherence can also be viewed positively: it gives us the possibility of studying aspects of the texts which would be unknown to us, or at least uncertain, if we only had one or two isolated examples from disparate dates and locations.

Of the thirty-five separate Hegra tombs involved, the gender of the maker or owner of the tomb is clear in thirty-three cases (setting aside the three interior inscriptions, and also one which is anonymous [H15] and one which is unclear [H18]). Of these twenty-two are owned by males, seven by females and four are owned jointly by males and females. Of course there are lots of other anonymous uninscribed tombs at the site (and indeed at Petra itself). At Hegra, the figures indicate that 67% of the tombs on which we have information were exclusively owned by males and just over 21% by females. The jointly owned tombs account for 12%. If we count in the jointly owned tombs (counting them as halves), the figures are more like 73% and 27%. Obviously we cannot put much weight on

these statistics: the sample might be untypical for some reason unknown to us. Indeed, Hatton al-Fassi's theory (al-Fassi 2007: 67-72) that males were often absent on caravan journeys might explain the figures without our having to reach far-reaching conclusions about women in Nabataean society. But at least we can see that women were well represented in the community of tomb owners throughout the period of the first century when the tombs were being dedicated. What can be said without any doubt is that women enjoyed legal agency in Nabataean society. "Agency" in this context refers to the "power to act" which individuals enjoy. In this sense women certainly had legal power to act and a legal status which appears not to be in any sense secondary to that of men in the society.

The inscriptions of Hegra show that women could own tomb property, determine who should inherit it and use it and dispose of it through selling — all these actions show legal agency. But apart from these evidences from within the tomb inscriptions, we know that women conducted other legal activities in buying and selling property from the Babatha archive. The fact that Babatha was Jewish is irrelevant here: she lived within Nabataea and followed Nabataean legal practice. But in any case we still have the fact that two of the earliest of the documents in the archive (dated AD 97) are ones in which a Nabataean woman sells property, first to a Nabataean man and then to a Jewish man. Nabataean women could own and dispose of property. (See now Esler 2017 for an attempt to understand the interrelationship between the documents of this archive.)

Of course, there is always a "but" in the discussion of evidence of this kind and the reason I hesitate to get carried away with the idea that women had a prominent role in the society is that outside the legal sphere we have precious little evidence. We do, of course, have the question of the role of Nabataean royal women. They certainly appear in inscriptions and on coins, but this is always in a secondary position to men.

Returning to the tomb inscriptions, in approaching the comparative study of these inscriptions we need to note that not all are functionally of the same type. Three (H2, H11 and H13) are *interior* inscriptions, i.e. not located on the façade of the tomb. They do have legal significance, and can be compared to interior inscriptions inside Palmyrene tombs, but they do not fall into exactly the same

category as the exterior inscriptions. All three do, however, follow the identificatory pattern described earlier: *'lh try gwhy' dy PNN, dnh gwh' dy 'bdt PN* and *dnh gwh' dy 'bdt PN*, and H11 is as full of legalistic detail as the exterior inscriptions, so it *could* be considered alongside them.

Thirdly, there are some of the inscriptions which are remarkably short (H10, H14, H21, H22, H23, H25 and H35). These cannot easily be compared from a formal point of view with the standard inscriptions. And three are very fragmentary (H6, H17 and H18). While we do not exclude these from the general comparisons, they can only be regarded as throwing secondary light on the standard pattern, or, to be more exact, the standard pattern, once established, can be expected to throw light on them.

When we set aside the interior inscriptions and the ones which only refer to masons or are unfinished (H15, H21), we are left with the still substantial number of twenty-four inscriptions of identical genre (as well as the three fragmentary ones). The following table gives a synoptic view of these twenty-four inscriptions, showing dates, the gender of the maker or owner of the tomb (m = male; f = female) and the presence (✓) or absence (-) of three distinctive features: reference to the inviolability of the tomb, fines for infringement of its regulations and curses similarly on those who might infringe. Note that the list does not include the whole corpus, but only the well preserved full texts, since the purpose is to focus on the schema of the inscriptions which echo legal formularies.

| H = JS | Dates AD | Gender of founders or owners | Inviolability | Fines | Curses |
|--------|----------|------------------------------|---------------|-------|--------|
| 1 | 4/5 | m | ✓ | ✓ | ✓ |
| 3 | 31/2 | m | - | - | - |
| 4 | 42/3 | m | - | - | - |
| 5 | 31/2 | m | - | ✓ | - |
| 7 | 27/8 | m | - | - | - |
| 8 | 1/1 | m | ✓ | - | ✓ |

| | | | | | |
|----|-------------|-----------|---|---|---|
| 9 | 35/6 | m | - | ✓ | - |
| 12 | 34/5 | f + f + f | - | ✓ | - |
| 16 | 1/1 | f + f | - | ✓ | ✓ |
| 19 | 26/7 | m | ✓ | ✓ | ✓ |
| 20 | 49/50 | m | - | - | - |
| 24 | 36/7 | m + f | - | - | - |
| 26 | 60/61 | f | - | - | - |
| 27 | 16/7 | m | - | - | - |
| 28 | 9 BC- AD 40 | m | - | ✓ | - |
| 29 | 8/9 | m | - | - | - |
| 30 | 7/8 | m + f | - | ✓ | - |
| 31 | 9 BC -AD 40 | m | - | ✓ | ✓ |
| 32 | 39/40 | m | - | - | - |
| 33 | 39/40 | m + f | - | - | - |
| 34 | 71/2 | f | - | ✓ | - |
| 36 | 31/2 | m | - | ✓ | - |
| 37 | 56/7 | m + f | - | - | - |
| 38 | 63/4 | m | - | ✓ | - |

Given the coherence of the corpus we can expect to be able to establish clearly the structures which are normal, even if they are sometimes departed from. This will constitute the pattern of the “form” of funerary inscriptions at Hegra. There are one or two comparable Nabataean items from outside Hegra too, which should be taken into account in a fuller discussion. Laïla Nehmé has recently produced a very detailed analysis as part of her other *magnum opus* on the Hegra tombs of 2015 (Nehmé 2015: 100-41) and we should note also Dr Mahdi Alzoubi’s publications on law of 2010 and 2012. Here I am focussing on the broader formal structures reflected in the well-preserved full representatives of this type of inscription.

It would, on the basis of this analysis, be possible to reorder the texts typologically, but it is easy enough to see the basic pattern:

1. All begin with the formula “This is the tomb (+ other related property in the case of H1) which PN(N) made *or* which belongs to PN(N)” (H7, 8, 33: *qbr’*, otherwise *kpr’*). The formula is used for three different legal types: foundation (“This is the tomb which so-and-so made for himself”), ownership (“This is the tomb which belongs to so-and-so”: H33, 34, 37) and, in two more complex cases, foundation and immediate gift (“This is the tomb which so-and-so made and gave to so-and-so”: H24 and H27).
2. Almost all end with the date (20 out of 24). The exceptions are H8 (reference to inviolability customs at the end), H16 (date in the middle), H32 (the possible offences at the end) and H31 (supplementary fine at the end).
3. Reference to additional beneficiaries, to curses, possible offences and fines are optional in the basic structure, though offences are mentioned in 17 out of 24 cases, so they are normal even if not compulsory.
4. There is a subgroup of shorter inscriptions in the list (H7, H20, H24, H29 and H37, possibly to be expanded by addition of H14, H22, H23, H25 and H35) in which there is no reference to curses, offences or fines.
5. The inviolability of the tomb is only mentioned in 3 cases, H1, H8 and H19 (all of approximately the first quarter of the first century AD).
6. H1, H8 and H19, as well as H16 and H31, contain curses. Again these are all within the range of the first quarter of the first century AD.

From all of this evidence it is clear that there is an underlying formulary and practice behind the tomb inscriptions. The fact that they seem on the surface quite varied should not lead us to the conclusion that they were simply made up *ad hoc*. There was an underlying structure which had to be adhered to in order to ensure the legal validity of the underlying document. This underlying legal structure also suggests that the summaries were drawn up by scribes who were in a position to read and distil the content of the legally binding original documents.

Such documents had to specify the property which was the subject of the transaction. In landed property such as that referred to in the Babatha archive, the identification of the property was established by reference to abutters, i.e. by listing the owners of the adjacent properties. Abutters are an essential part of a legal document on immovable property. One could imagine circumstances in which that might have been necessary with a tomb, if identification could be put in any doubt or could be challenged. But in the case of our inscribed tombs the inscription itself identifies the tomb in question and there was no need for reference to abutters.

There might have been reference to abutters in the longer papyrus documents of ownership of which the inscriptions are merely abbreviated forms, and this is even more likely in the case of the many tombs which have no inscription on them: they were all owned by someone and there must have been some written record of who owned which, certainly in a place where there are dozens of uninscribed tombs next to each other, as at Hegra and Petra itself.

Although the legal character of the Hegra tomb inscriptions is clear (see Healey 2013), this does not mean that they constitute legal documents of themselves or that they are *copies* of legal documents kept elsewhere. In this context we should note the reference to the *nsḥt* of the tomb inscription kept in an archive according to H36: 9. Although this word is translated as “copy” in Healey 1993: 226-31, the notes there make it clear that the meaning is a little vague and “exact copy” is certainly not intended. In Neo-Babylonian (CAD N/II, 267-9) the original word, *nishātu*, can mean “official record” or “excerpt”. If this were the meaning in H36: 9, it would indicate that the main legal document was kept in the archive and the inscription is *not* a word-for-word copy of that original. The inscription on the tomb contains a summary, but its main and specific purpose was to indicate ownership by pointing it out.

The absence of witnesses also tells against the idea that the inscriptions are of themselves legal assertions of rights, like oaths in the presence of witnesses before a notary. The inscriptions cannot be classified in this way. The fact that a tomb inscription was non-portable is also significant: it could not be produced in court, even if the court were held in Hegra itself!

The inscriptions are, however, legal in context, alluding to legally binding documents which exist elsewhere and which could be produced in court. But these legal aspects of the inscriptions are mostly concentrated on the practical effects of the situation and on the dire consequences which would ensue for anyone who ignored the warning:

1. There are curses.
2. There are fines.
3. There are broad indications of who is and is not eligible to enter the tomb or be buried in it.
4. There are restrictions on its disposal.

These items are clearly concerned with the protection of the tomb and require no further comment in this context. The combination of curses with fines had often been commented on and may still be regarded as fairly unusual (Healey 2013).

The regular inclusion of dating is more intriguing: there is always (in complete inscriptions) a date. What is the dynamic behind the inclusion of a date?

First there is a slight oddity in the datings, since only months, not specific dates are mentioned. This has parallels in the more or less contemporary tomb inscriptions of Edessa and Palmyra. This is completely at odds with normal legal documents in both Nabataean and Syriac (and probably Palmyrene). Where there is a real legal situation in the background we must assume that a full date would be provided. This, then, is a further indicator that the texts in question are not of themselves legally constitutive: a legal document always has an exact date, the date on which it is executed in front of witnesses.

The vaguer dates in the tomb inscriptions, vague in the sense of not indicating a precise date, are, therefore, a little difficult to explain. Perhaps they relate in some way to the archival copies of the texts which lie behind what appears on the tombs. It could be that even if a precise date was not needed, it was felt useful to indicate a rough date so that the archives could be searched efficiently. Alternatively, it could be that the dating formula arises only incidentally as part of a habit of including the name of the king — as a way of expressing loyalty.

We can summarize the legalistic schema of the tomb inscriptions in the accompanying diagram. Some elements are compulsory, some are normal and some are purely optional.

Concluding remarks

Overall, from both parts of the paper, I would argue that the structural patterns of inscriptions give important insights into their meaning and function. Many years ago I wrote an article about the “Remembered be ...” (*dkyr ...*) formula in Aramaic inscriptions (Healey 1996). And a similar form-based approach was also taken by Dijkstra (1995) in his study of the inscriptions which include the formula “for the life of ...” (*ʾl hyy ...*).

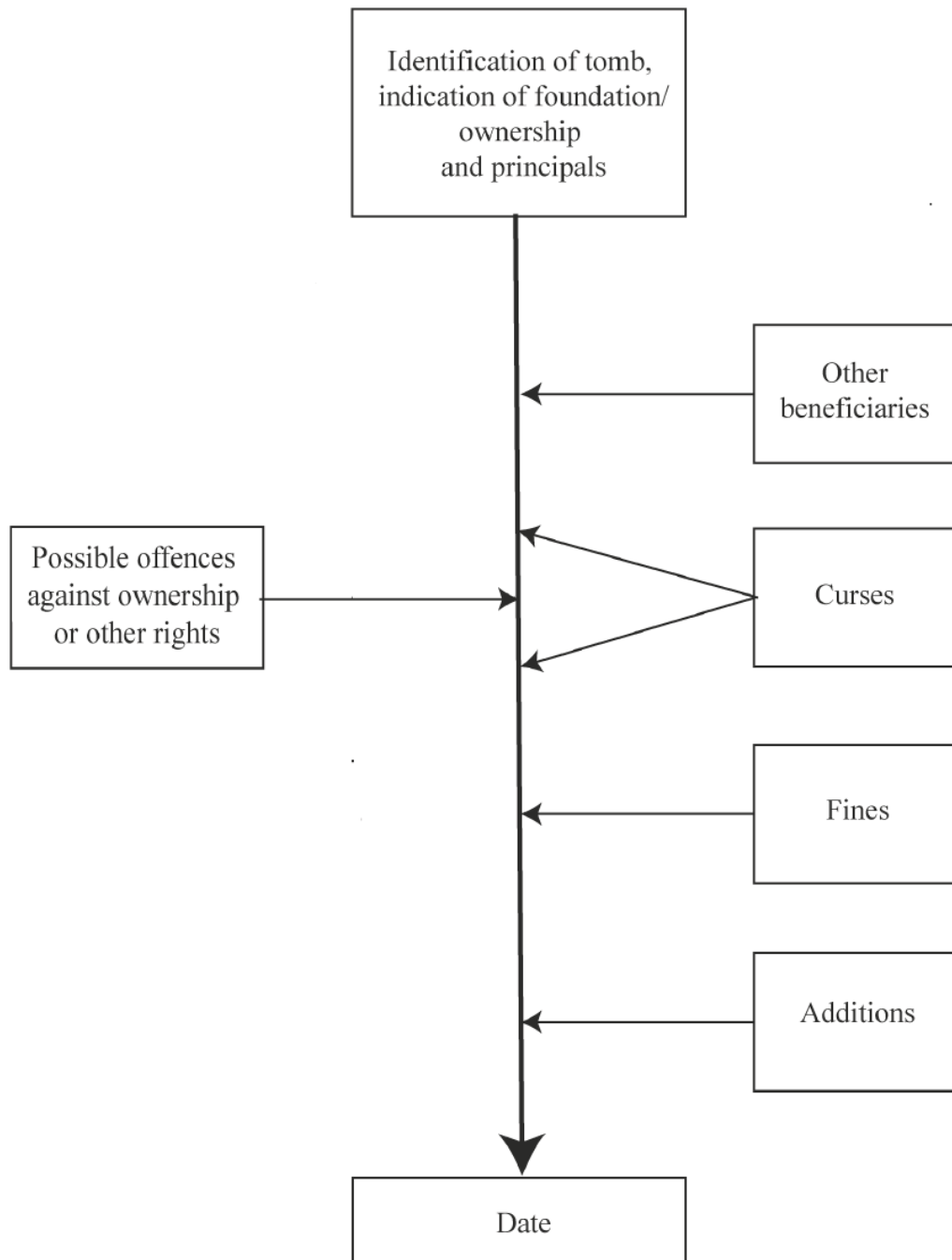
This paper is an attempt to scratch the surface of the tomb inscriptions on the same basis of comparisons of formal elements with other Nabataean and non-Nabataean inscriptions. At the very least it proves that comparison with other materials from the world of Aramaic inscriptions can throw light on the Nabataean ones.

The Schema of the Nabataean Tomb Inscriptions

Normally included

Compulsory

Optional



Sigla and References

CAD = *Chicago Assyrian Dictionary*

CIIP = *Corpus Inscriptionum Iudaeae/Palaestinae*

CIJ = *Corpus Inscriptionum Judaicarum*

CIS = *Corpus Inscriptionum Semiticarum*

H = Hegra tomb inscriptions in Healey 1993

IGLJ = *Inscriptions Grecques et Latines: Inscriptions de la Jordanie*

JS(Nab) = Nabataean inscriptions in Jaussen and Savignac 1909-14

Littmann = Nabataean inscriptions in Littmann 1914

MP (Milik Pétra) = Nabataean inscriptions in Nehmé 2012

PAT = Palmyrene inscriptions in Hillers and Cussini 1996

RES = *Répertoire d'épigraphie sémitique*

WR = Nabataean inscriptions in Winnett and Reed 1970

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HISTORIC REPEAT PHOTOGRAPHY AS A TOOL TO ASSESS TOURISTIC LANDSCAPES: A CASE STUDY IN PETRA, JORDAN

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Abstract

*When a location is protected, a perceived value is placed upon it. That value, in turn, makes it more attractive for tourism and, arguably, more susceptible to anthropogenic landscape change. Understanding the nature and patterns of landscape change allows governing agencies to better allocate monetary and human resources to better manage irreplaceable cultural resources, such as the ancient ruins of Petra, Jordan. A multitude of factors impact Petra, and this preliminary research sought to identify tangible manifestations of tourism within the city using modern research methods. Utilizing several historic photographs from Sir Alexander Kennedy's 1925 book, *Petra: Its History and Monuments*, this research employed a method known as historic repeat photography (rephotography) to assess landscape change in Petra over the past 90 years. The visual extent of physical landscape change—whether beneficial or detrimental—was assessed via five main criteria: large erosion events/obvious decay, vegetation change, impact of foot tread on ancient Roman pathways, reconstruction/restoration, and vandalism/utilitarian use of space. Restoration and tourism infrastructure development were among the most substantial landscape changes seen in Jordan's most famous cultural tourism attraction, indicating the city's current status as a touristic landscape is a possible continuation of Petra's eclectic architectural and occupational history.*

1. Introduction

The ancient city of Petra, hidden in the colorful sandstone cliffs of southern Jordan, has become one of the Kingdom's most popular tourist destinations

attracting visitors from all over the globe. But at what cost? Similar to many other popular destinations, widespread tourism was not prevalent in Petra until post-World War II, when international travel became more accessible to the average consumer (Ringer, 1998). Within less than a century, the city of Petra went from a forgotten desert refuge to a booming tourist destination witnessing up to a million visitors every year (PNT, 2013). Understanding the effects of this radical transformation is imperative to the city's survival, as many monuments have already begun to deteriorate more intensely under the strain of continual tourist activity (Paradise, 2005). To that end, the purpose of this research was to determine how the multifaceted influences of tourism have manifested in physical landscape change between 1925 and present day in Petra, Jordan, using historic repeat photography.

Tourism itself is a vastly complex international phenomenon (Ringer, 1998). Within the last two decades it has become one of the largest and fastest growing economic sectors in the world (WTO 1997). This rapid global expansion of tourism-focused development has unsurprisingly attracted the attention of the scientific community (Mitchell and Murphy, 1991; Hall and Page, 2014). While specific case studies and parameters differ, several common themes exist within tourism literature. These include but are not limited to the commercialization or commodification of space/culture for the consumption of the tourist (e.g. Rojek, 1993; Urry 1994), economic consumption theories such as supply and demand of touristic resources (Garrod and Fyall, 2000), the creation of "touristic cultures" (e.g. Hitchcock et al., 1993), and gaining a better understanding how complex social processes are manifested in spatial configurations in the landscape (e.g. Mowl and Turner 1995). Prompted by the diverse range of travel purpose/touristic activities, tourism research is often broken into a myriad of subcategories such as ecotourism, sport tourism, religious tourism, shopping tourism, adventure tourism, resort tourism, cruise tourism, and cultural/heritage tourism (Timothy and Boyd, 2006). Historically, "heritage" has been defined as "present-day use of the past" (Ashworth, 2003; Graham et al., 2000), therefore, existing tourism research specializing on heritage tourism has focused on particular social, political, and economic trends.

The social influences and consequences of heritage tourism generally involve concepts of perception, identity, and authenticity (Timothy and Boyd, 2006). Inherent to the very concept a heritage, the idea of personal perception and identification with a certain place, people, or cultural has been heavily researched in tourism studies. Herbert et al. (1989) found that visitors to heritage tourist sites tended to be better-educated, bigger spenders, and more likely to travel in groups than other forms of tourist destinations. This may reflect a higher awareness of cultural significance or historical knowledge of the destination in question. There have also been several studies on the connections between heritage tourist destinations and individual associations with that place—many times surrounding tragedies or site of atrocities such as holocaust site (Coles and Timothy, 2004; Stephenson, 2002; Timothy, 1997).

Equally significant in the social realm is conceptualizing the “authenticity” of heritage. It could be argued that once a heritage site has been modified to accommodate tourism it has, in fact, become something entirely different and only reflects the level of authenticity desired by the tourist population – thus forfeiting true authenticity of the original place (Timothy & Boyd, 2003). Currently an industry buzzword, ensuring authenticity has been the focus of countless tourism-related agencies, host communities, and organizations—particularly in marketing campaigns and advertisement (Apostolakis, 2003). From an academic standpoint, the “authentic experience” has been researched from a number of different perspectives including the correlation between perceived authenticity and tourist satisfaction (Moscardo & Pearce, 1986; Chhabra et al., 2003), the degree to which visitors are actually seeking reality or just experience culture different from their own (Halewood & Hannam, 2001; Moscardo, 2000; Schouten, 1995), and to what extent tourists are able to distinguish between authentic and falsified experiences (Urry, 1995; Herbert, 1995).

Similar to authenticity and perception of place, political research in heritage tourism varies significantly depending on the target population and complex histories. As discussed by Timothy and Boyd (2008), history is neither singular nor static and, therefore, the way in which heritage is presented to the tourism community is highly subjective and prone to particular biases or exclusions

(Buchholtz, 2005; Mordue, 2005; Timothy & Boyd, 2003). In fact, there have been many instances in which attempts were made to actively ignore or erase unsavory histories associated with a culture, such as Romanian and Hungarian thwarted efforts to eradicate all evidence of communist rule—a significant period in their history (Light, 2000). Conversely, heritage tourism has also used to evoke patriotism in local communities and strengthen international relations via honoring shared heritage (Morales Cano & Mysyk, 2004; Chronis, 2005).

These trends have influenced the direction of current tourism research in culturally significant landscapes—such as Petra, Jordan—but risk neglecting intellectual paucities regarding physical landscape change in conjunction with enhanced touristic activities. That said, there have been a handful of studies focused on the physical relationships of tourism and landscape change (e.g. Paradise, 2005; Mihai et al., 2009) but not to the same capacity of the humanistic research trends. Jamal and Kim (2005) illustrate how the tourism research community has become overly specialized and advocate for more holistic and interdisciplinary approaches to tourism studies. The preliminary research presented here is in attempt to produce such a comprehensive study on the multifaceted influences of tourism manifested in observable landscape change. Petra's international fame and relative tourism stability, makes it an ideal case study to analyze the tangible manifestations in touristic landscapes—information applicable to worldwide heritage management.

2. Site Setting

Often called “The Valley of the Crescent Moon”, the dramatic Valley of Petra has a distinctive curve that resembles a crescent when seen from above. At an elevation of 900-1000m above sea level, Petra is in the transition zone between the more temperate Highlands and the harsh desert of the Wadi Araba. Petra's climate can be categorized as a Mid-Latitude Dry Semiarid Steppe, specifically a *BSk* in the Köppen Classification, although the cool, wet winters and hot, dry summers often resemble a Mediterranean climate (Cordova, 2007). In Petra, average temperatures range from 6°-12°C in the winter months to 15°-32°C in the summer with less than 130 mm average annual precipitation (Jordanian Meteorological Division, 1971).

As part of the Northern Araba Drainage Basin, Petra is located in a valley surrounded by steep sandstone cliffs fed by slender canyons (siqs) and a myriad of wadis, or ephemeral streams, that run through the city center. Prone to flash floods, the namesake Wadi Musa is dangerous during storms and many precautions are taken during rainier winter seasons, especially in the narrow entrance of the Bab As-Siq, where 20 tourists drowned in a major flashflood in 1963 (Al-Weshah & El-Khoury, 1999). In fact, it has been speculated that Petra has experienced one or more catastrophic flood events in recent history, as indicated by large flood deposits discovered significantly above known water channels (Paradise, 2012). Other major drainages in Petra include the eastern Wadi ed-Mataha and Wadi Turkmaniyya from the north. Numerous other smaller wadis weave throughout the valley, which, with the aid of water entrapments and dams, allowed people to reside in the city for several hundreds of years (Browning, 1973).



Figure 1: Image of the ad-Deir (left) and al-Khazneh (right) demonstrating the dramatic sandstone features in Petra, Jordan. Also note the presence of tourists despite these photos being taken during the off-season. Photographs by K.M. Groom.

However, the most noticeable physical characteristic of Petra is also one of the most alluring: its vibrant sandstone (Figure 1). Along with the eclectic architecture and hewn monuments, the unique geology mesmerizes visitors and researchers alike. Displaying some of the oldest exposed sandstone on earth, Petra exists at the contact of two siliciclastic components of the Ram Group: the

Cambrian Umm Ishrin Sandstone at the base and the Ordovician Disi Sandstone above. The Umm Ishrin Formation is a quartz arenite with cross-bedded components of siltstone and mudstone, feasibly representing the fringe of a fluvial system (Makhlouf & Abed, 1991). The Umm Ishrin is also responsible for the famous “Rose Red” color found in the city, although its color ranges from red to salmon, chocolate, or a deep mustard yellow. Continuing the culinary descriptors, the distinctively white or cream-colored Disi Formation is the “icing on top”. Significantly coarser, the Disi Sandstone lacks horizontal cross bedding and was deposited in a braided stream environment among numerous dunes and sandbars (Nairn & Alsharhan, 1997). The fairly uniform Disi across Jordan is more inconsistent in Petra due to irregular and unconforming contact with the as-Shara Limestone above the Bedouin village, Umm Sayhoun, and Wadi Musa.

Beyond its natural beauty, the city of Petra boasts an elaborate array of carved and constructed sandstone monuments from several well-known civilizations including Nabataean, Roman, Byzantine, and Crusader. Each occupational period contributed their own distinctive styles, architecture, and building methods to the existing infrastructure, creating the unique metropolis found today. The obvious historical significance of the city has invariably attracted countless archeologists from local (e.g. Al-Bashaireh and Hodgins, 2011) and international agencies and universities (e.g. Acevedo et al., 2001; Ortloff, 2005). Similarly, the myriad of stone structures also endorses geomorphologic research with a variety of foci, including: evaluating conservation techniques (Al-Saad and Abdel-Halim, 2001; Wedekind and Ruedrich, 2006), assessing restoration methods (Bani-Hani and Barakat, 2006), quantifying physical impacts of tourism (Franchi et al., 2009; Paradise, 2010), rock-fall hazard assessments (Delmonaco et al., 2013), and even uncovering evidence for past catastrophic events (e.g. Russell, 1980; Paradise, 2012). In modern history, the most significant turning point for Petra came December 1985: inscription into the United Nations Educational, Scientific, and Cultural Organization’s (UNESCO) World Heritage Conservation program, effectively turning the once lost Nabataean Capital and its gateway town of Wadi Musa into the country’s most visited tourist attraction with nearly a million visitors in 2010 (PNT 2013). But what kind of landscape change has resulted from such a dramatic shift from an unknown city to a major tourist attraction?

2. Research Methods

First employed soon after the invention photography itself, repeat photography has proven to be a useful and versatile tool in the social and physical sciences (Webb, Boyer, and Turner, 2010). One of the earliest pioneers of employing rephotography as a scientific tool was a Bavarian mathematician named Sebastian Finsterwalder, who, in 1888, used the technique to monitor glacial change over time (Hattersley-Smith, 1966). His research was so successful repeat photography spread in popularity and has been a longstanding tool in glaciology (Byers, 2007; Fox and Cooper, 1998). Since then, the technique has spread to other disciplines such as ecology (Clements, 1905), geology (Bryan and La Rue, 1927), and geomorphology (Lobeck, 1939). Not limited to the physical sciences either, rephotography has also been used to assess social concerns such as land-use change (Kull, 2005), socio-economic influences of tourism (Finn et al., 2009), and to monitor the effectiveness of rock art conservation (Groom, Forthcoming; Loubser, 2011). The method has also been adapted for use in anthropology as a means to assess place meaning and awareness (Smith, 2007). While applications may vary, the fundamental idea behind repeat photography is comparing old and new (repeat) photographs taken from the same perspective. There are several methods for finding these perspectives, also known as vantage points or camera stations, but no one methods is superior to another – each is case specific (Boyer, Webb, and Turner, 2010). Popular ways to find vantage points range from using the principles of parallax by identifying the cross lines between foreground and background elements in the photo (Malde, 1973) to utilizing geospatial technologies and advanced photogrammetry (Hanks, Blair, and Webb, 2010). The most common method, however, is what is known as the Brute-Force Technique, where the researcher looks for major landforms in the photo and ‘walks into the view’ (Hanks et al., 2010). Once the vantage point is located, the camera is then adjusted to match elevation, tilt, and azimuth to get the most accurate repeat photograph. The degree of precision necessary often depends on the research topic and the preference of the researcher (Boyer et al., 2010). However, many of these methods risk being too tedious and time consuming for the time allotted for the proposed research. Therefore, the

authors will use printed transparent slides of historic images in junction with the camera's optical viewfinder to accurately match the historic photo with the modern landscape.

Of course, repeat photography also has to work within some fairly tight constraints and limitations. First of all, obviously, researchers wishing to employ repeat photography are restricted to locations depicted in historic photographs. For some places, necessary photographic records simply do not exist and are, therefore, excluded from any kind of rephotographic assessment. Secondly, not all photographs are eligible for reliable replication. In almost all cases, camera stations are located by somehow interpreting the relationship between identifiable objects in the foreground versus those in the background (Boyer et al., 2010), so if a photograph lacks one of these two components then finding the exact camera location becomes significantly more complicated. Similarly, it would be exceedingly problematic to confidently find the vantage point of a photograph only showing indiscriminate or common landmarks, such as trees or hills.

Another limitation, or complication, with repeat photography involves technology. Photographic technology has advanced rapidly throughout the years, slightly altering photographs along the way (Boyer et al., 2010). Everything from focal lenses, film material, film size, even the jump to digital cameras influences the quality and shape of a photograph. Much like cartography, photographs are 2D representations of a 3D landscape and, therefore, some form of image distortion is inevitable and each camera evolution alters the degree of this distortion (Boyer et al., 2010). For that reason, researchers must be aware of differences in camera equipment used by the original photographers when interpreting landscape change between photographs.

Despite these restraints, repeat photography it still a valuable research tool for more holistic analyses of overall change. This can include everything from surface recession and rock decay, vandalism, litter, land use, to any other ways in which human or natural activity may have impacted the overall stability of the site. For culturally sensitive sites, such as the Petra archeological park, comprehensive evaluations are critical for the creation of better management policies and addressing issues often missed in traditional or overly focused

assessments. Landscapes are complex and interactive systems; therefore, the research designed to understand them should be equally dynamic—or at the very least capable of accommodating the multitude of factors influencing their development and change.

Specific to the proposed research in Petra, Jordan, the photographic record chosen for repetition comes from the book *Petra: Its History and Monuments* written by Sir Alexander Kennedy in 1925. Containing over 200 individual photographs, including some of the first aerial shots of the city, this volume depicts a very different Petra—one nearly devoid of tourism, something that would not come to Petra for another two decades. Structured comparison of Sir Kennedy’s pre-tourism photographs with modern repeats display considerable change in some ways and remarkable similarity in others, demonstrating the complex nuances of human and environmental influences in cultural touristic landscapes.

To most reliably identify and assess visual differences between historic and repeated photographs four separate criteria were assessed:

- Vegetation change
- Foot tread and trail degradation
- Vandalism and utilitarian use of landscape (e.g. power cables)
- Reconstruction and restoration

Each criterion were analyzed in relation to known intrinsic and extrinsic rock decay forces, representing the relationship between natural occurrences and anthropogenic forcing. In terms of the last two criteria, most, if not all, change falling within these categories can be confidently assumed as being the direct result of human activity (i.e. tourism) with reconstruction and additional infrastructure being the most common, and striking, visual changes.

3. Results and Analysis

While this is an on-going endeavor, at least 15 historic images from Sir Kennedy’s 1925 volume have been successfully repeated so far—with several other sites identified for future efforts (Figure 2). Although Kennedy (1925) contains a variety of images displaying everything from the local people, broad landscapes, viewsheds, and monuments, the subject matter of the repeated

images focus primarily on hewn and built facades throughout the valley as they were most readily identified and located in the field. For ease of interpretation and presentation, examples will be given for each of the five criteria instead of outlining changes seen in each of the fifteen pairings. More detailed assessments and discussion of specific changes depicted in every image will be provided in future publications, most likely a book or larger volume, once a greater number of repeat pairs have been collected.

Vegetation change

Popularly used in ecology and land-use management, repeat photography can be a very effective tool to assess vegetation change over time—and Petra is no different. Nearly every photograph pairing displayed a fairly dramatic decrease in vegetation size and distribution. Among the most significant examples of this are along the Royal Tombs, where widespread desert shrubs

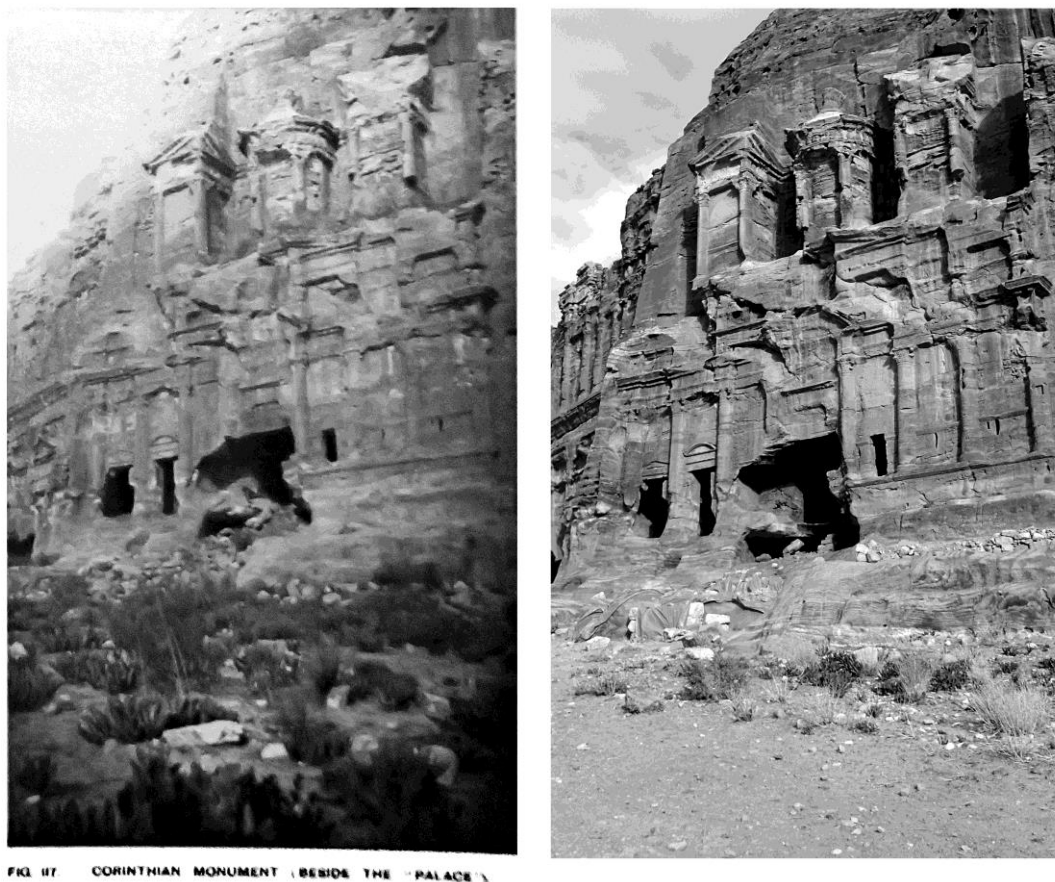


Figure 2: Repeat pairing of the Corinthian Tomb along the Royal Tombs ledge. Right- Kennedy (1925). Left- Photo by author 2016.

have been reduced to a handful of small shrubs and grasses (Figure 2). The exact cause of this change is unknown and could be any number of factors influencing the region (e.g. over-grazing, land-use changes, climate change, increased foot tread, etc.). That said, it can be assumed that at least to some degree increased tourism and the lack of a set trail system limits vegetation regrowth (Marion & Leung, 2001), particularly around the monuments where foot tread and vehicle traffic are the most concentrated.

Foot tread and trail degradation

While vegetation loss is one potential impact from increased foot tread, trails and areas of significant foot traffic face several other management challenges in touristic landscapes, such as Petra. This particular criterion pertains to soil reduction, destruction of features along trails or popular routes, and the creation of trails themselves. Much of the cultural stone decay taking place in Petra occurs at a much finer scale than can be clearly seen in the repeat images, so this assessment focuses more on the broader landscape scale changes. The iconic view of the Khasneh (Treasury) through the Siq is a prime example of how trails and foot tread have influenced landscape change (Figure 3). For one, the sediment along the Siq has been considerably compressed and/or depleted over the past century, indicated by the lower ground level in the modern photograph. The texture of the trail is also much smoother as natural cobbles and stones have been moved to facilitate easier transportation, both by foot and horse cart. Beyond this, there are also clear signs of vegetation changes between the two photographs and the obvious tourism land-use of the Khasneh area in the modern image—exemplifying how repeat photography is a powerful tool to capture a more holistic representation of landscape change.



Figure 3: Repeat photo pairing looking at the Treasury from the Siq—one of the many images that has made Petra famous. Right- Kennedy (1925). Left- Photo by author, 2016.

Of course, it can be argued that not all tourism-driven landscape is bad and that resources gained from tourism can, and should, be used to protect and responsibly share heritage with the world (Jamal & Kim, 2005)—such as the establishment of a trail system within Petra. While the movement of people is less controlled around many of the outer tombs and monuments, some of the main routes, such as the main entrance, have clear and defined trails, which help minimize visitor impact on the surrounding areas. The repeat pairing of the Djinn Blocks near the Bab al-Siq (Figure 3) show how the creation of a trail might have destroyed some desert vegetation but in the end constrain tourist traffic and allow for larger plants to grow. The installation of trashcans (seen in the lower left corner of the modern image) helps decrease litter and waste.



FIG. 196. BAB-AL-SIQ, WITH SAHRUJ MONUMENTS

Figure 4: Djinn Blocks at Bab Al-Siq—the main entrance into Petra from Wadi Mousa. Right-Kennedy (1925). Left- Photo by author, 2016.

Vandalism and utilitarian use of landscape (e.g. power cables)

While vandalism is a major concern for any tourism destination, its prevalence in Petra as seen in the repeat photographs was surprisingly low—especially when it has devastated other sites in the region such as Wadi Rum further to the south. That said, the limited scale and distribution of historic photographs available does perhaps misrepresent vandalism issues in Petra, since many of the monuments' inner chambers are marred by carved initials, spray paint, and other forms of graffiti. The focus then turns to land-use and, for Petra and other significant archaeological sites, this means excavation. Several repeat pairings display some measure of impact from scientific exploration and the chosen example portrays a row of tombs along the Outer Siq (Figure 5). In the pairing, the significant removal of vegetation and ground material has exposed two doorways into lower tombs—which are now vulnerable to vandalism and misuse. The light-colored line along the lower sections of the monuments also

suggests there might be some residue from previous soil levels, which can promote further rock decay across those surfaces. However, here is an informative sign and trashcan visible in the modern photo, which indicates efforts are being made to mitigate damage to the now-uncovered monuments.

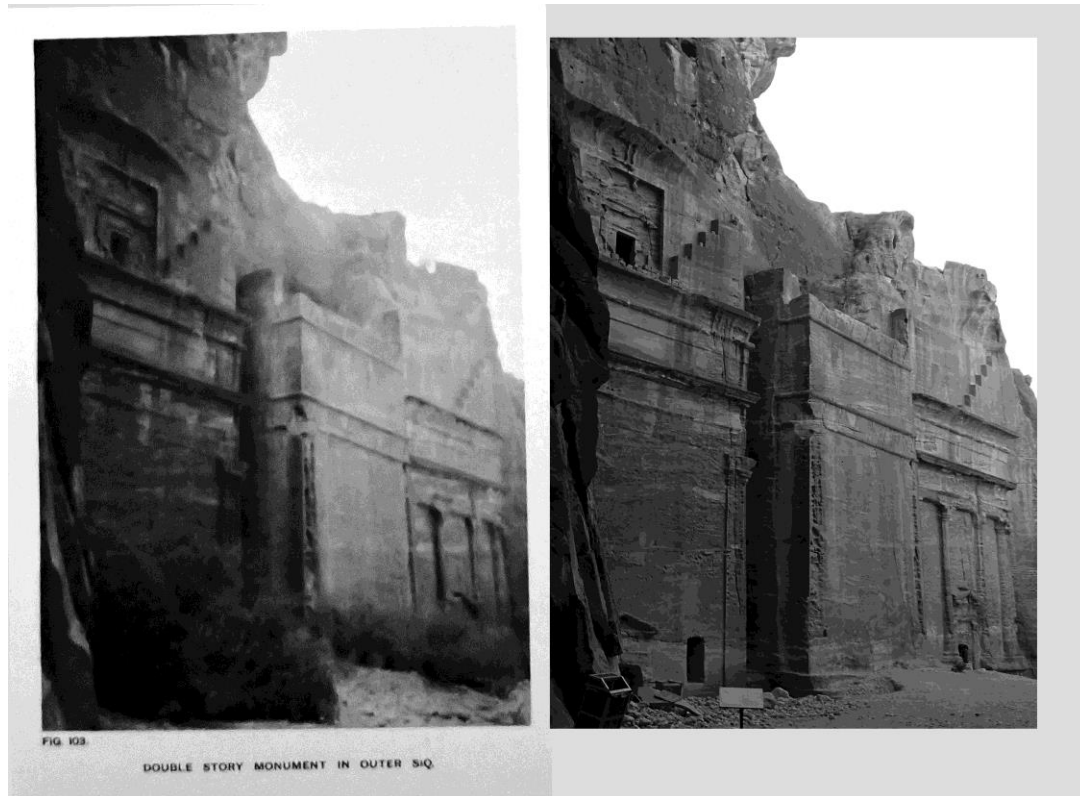


Figure 5: Double story monuments in the Outer Siq. Right- Kennedy (1925). Left- Photo by author, 2016.

Reconstruction and restoration

By far, the most obvious and dramatic landscape changes captured in the repeat photographs deal with monument reconstruction and restoration. Not necessarily connected to archaeological research, reconstruction can also be considered almost solely the result of, or desire for, increased tourism. For example, the steps leading up to the Urn Tomb have been completely rebuilt with a mix of old stones and new material (Figure 6)—a new trail leading to the tomb lined with shops and local stalls selling souvenirs and handicrafts. The new path is also considerably safer than trying to scramble up the debris field that once occupied the slope. Other repeat pairings displaying reconstruction or restoration speak for themselves (Figure 7).

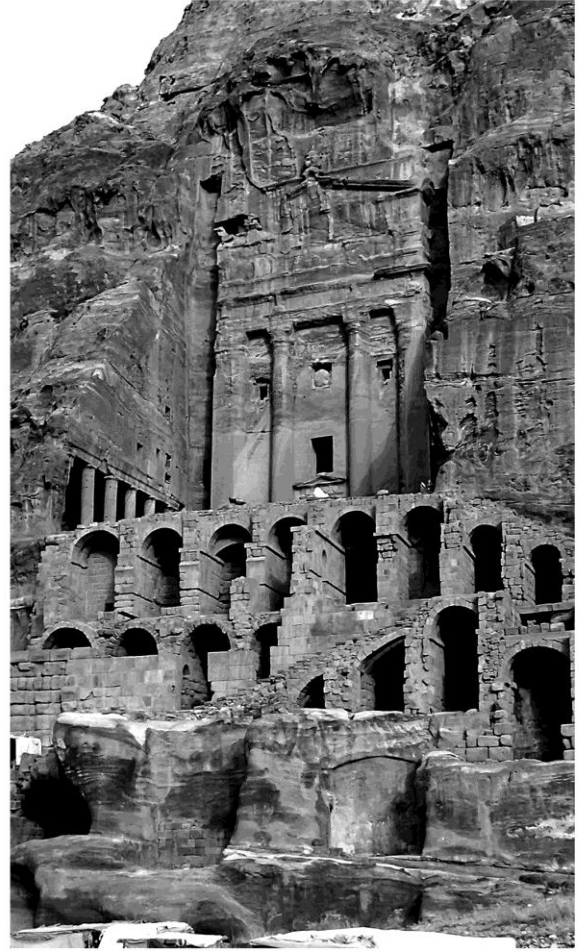


FIG. 116. THE URN TEMPLE—OUTER SIQ.

Figure 6: Urn Tomb with arches and stairway leading to it. Right- Kennedy (1925). Left- Photo by author, 2016.

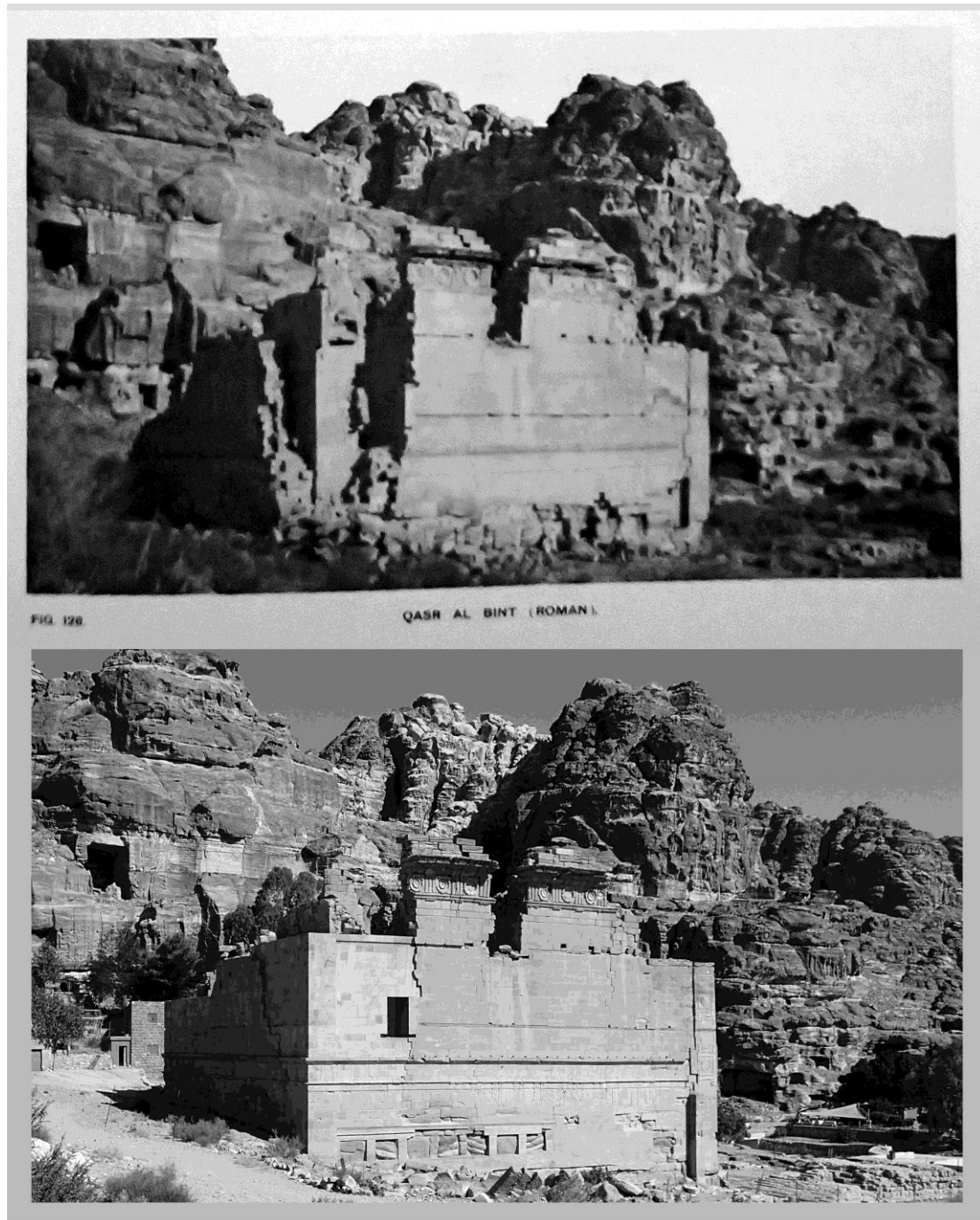


Figure 7: Qasr al-Bint showing significant reconstruction as well as path developments behind and in front of the built structure. The canopy of the museum/visitor center/restaurant can be seen in the modern image. Right- Kennedy (1925). Left- Photo by author, 2016.

Discussion and Conclusions

“Since the notion of heritage is integrally related to the past, it can be argued that heritage tourism is intrinsically about life, existence, belonging, and

change – from the past into the present and future...

It is these multifaceted dimensions that makes heritage tourism such an important part of tourism studies.”

- T. Jamal and H. Kim (2005)

Increasing the understanding of tourism in a theoretical and comprehensive framework is of global concern (Jamal & Kim, 2005). Heritage-based tourism, such as UNESCO World Heritage sites like Petra, Jordan, play an even larger role as they not only encourage the exchange of currencies but also exposure to different cultures, people, and ideas – for both the tourists and hosts. As one of the fastest growing economic sectors in the world, tourism is ubiquitous, and nations worldwide struggle to maintain the balance between economic and experiential benefits with resource degradation and exploitation. At what costs are we enjoying the landscapes of the past? Understanding the various impacts of tourism on a landscape represents a vital function to furthering management and conservation efforts, as well as prolonging their viability as an economic resource.

Petra, Jordan is a dynamic and evolving place. The purpose of this study is not to determine if landscape change in Petra is good or bad, simply identifying what has changes and speculating on the connections with observed increases in tourism. The way landscapes are managed profoundly reflects how we perceive their value, so management can be interpreted as priority-driven interaction with the landscape. That said, empirically understanding how tourism-manifested landscape change could remove some inherent subjectivity in cultural resource and heritage management (Groom and Thompson, 2011).

Essentially, the preliminary research presented here does not focus on whether or not heritage tourism *should* exist, but on the fact that it *does* exist, by addressing the tangible impacts tourism has on its surroundings. Tourism, heritage-centered or not, is a complex global phenomenon and, while it would be easy to get lost in the ethical debates, the truth remains: this powerful economic resource is not disappearing any time soon. Existing within this reality, heritage tourism management creates a delicate balancing act between cultural exposure and resource conservation, finding the best-case scenario within a complex and

dynamic system. In order to accomplish this equilibrium, scientific exploration remains necessary to identify the exact nature of tourism impact with the purpose of better informing management policies and promoting effective mitigation/conservation efforts.

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A NEW LATIN GRAFFITO OF THE LEGIO III CYRENAICA IN PETRA, AND ITS HISTORICAL CONTEXT

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Abstract

Recovering and preserving minor testimoniae is part of the responsibilities of scholars working in the field. Some graffiti appear sometimes in the propitious light, like a Latin graffito of the IIIrd Cyrenaica Legion I was happy enough to notice by chance on the sandstone rock façade in the walk coming from the Dayr, in July 2009, while conducting a group in Petra. The abbreviated name of the legion is followed by an acclamation, a rare formula I found in two other places; one incomplete Latin inscription found at Humayma, in the Hisma (restored); and the other one in a Latin graffito at Namara, south Syria, where the full inscription is easily legible, ending with a particular acclamation, Feliciter Invitta (sic). The issue of the presented evidence is the presence of the IIIrd Cyrenaica Legion in these three sites, presumably at an early time of the Provincia Arabia; these documents question the circumstances of the Roman occupation of Nabataea in the context of the Parthian wars.

Introduction

Recovering and preserving minor *testimoniae* is part of the responsibilities of scholars working in the field. In epigraphy for example, some graffiti appear sometimes in the propitious light, and then bring new information.

The graffito I present is an original addition to a list of five inscriptions and graffiti from Petra mentioning the *Legio III Cyrenaica*. Several other inscriptions issued by the members of the Third Legion were found in various sites of the *Provincia Arabia*, namely, from North to South: Bostra/Buṣṣrā (where the Legion was stationed from the early second century AD), An-Namara, Umm al-Quṭṭayn, An-Nmayra in South Syria; Khirbat as-Samra, Umm al-Jimal, Gerasa / Jarash,

Philadelphia / 'Amman in North Jordan, Humayma, Hegra, Azraq, Dumat Aelia Capitolina / Jerusalem, and especially in Bostra/Buṣrā in South Syria, where the Legion was stationed from the early second century AD (at the time of Hadrian) to the turn of the fifth century (Kindler 1983; Sartre 1985; Gathier 2000; Wolff 2000). The issue of the presented evidence is the presence of the IIIrd Cyrenaica Legion in this place, presumably at an early time of the *Provincia Arabia*, and its implication in the historical events of the first half of the second century. This is the case of a Latin graffito incised on the sandstone wall of Petra by a Roman soldier of the Third Cyrenaica Legion. I was happy enough to notice it by chance on the rock façade on the left side in the walk coming from the Dayr in Petra, in Spring 2009, while conducting a French group⁴.

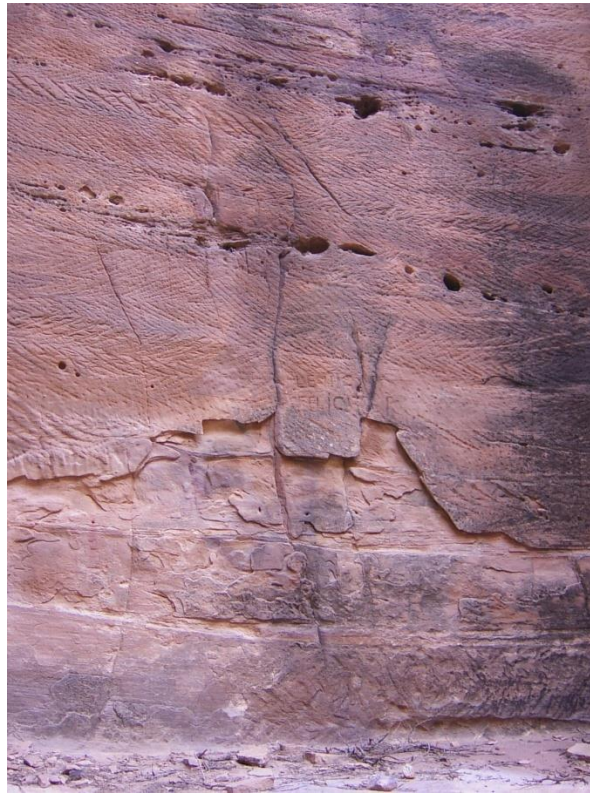


Fig. 1: General view of the Latin graffito location, the Dayr, Petra (ph. M.-J. Roche)

The Latin graffito from the Dayr

⁴I could not take measurements; the estimated height of the graffito on the façade is about 1,50 m, and the letters are few centimetre height.



Fig. 2. The Dayr Latin graffito mentioning the *Leg III Cyr* (ph. M.-J. Roche)

LEG III CYR
FELICIT -

Fig. 3. *Ib*, fac-simile (M.-J. Roche)

Two lines, badly weathered, are incised at eye level:

LEG III CYR

FELICIT(er) I(nvicta)

Legio III Cyrenaica

Fortunately invincible

The standardized abbreviated name of the Roman legion, the Third Cyrenaica Legion, Leg III Cyr, is easily restored in the first line; this legion is mentioned in other four Greek and Latin inscriptions and graffiti from Petra and its surroundings (*infra*).

The very originality of this graffito, which raises historical issues on the role of the Legion in the wars and conflicts of the IInd century AD is the second line; it is a rare formula, also easily restored, this time thanks to a unique other example found at an-Namara in Southern Syria.

Mentions of the *Leg III Cyr* in Petra

Before presenting the epigraphic evidence, it is worth mentioning another source which is a papyrus named *P. Mich. 466* (Préaux 1950-1951)⁵. This papyrus, found at Karanis, in Egypt where the Third Cyrenaica Legion was stationed, is a letter by a soldier of the legion, dated 26 March AD 107, writing from Petra to his father, himself a former soldier. He speaks not only of his own situation, expecting a position as secretary of the legion, but also of his comrades: they “...all day long were cutting building stones and doing other things...”. It has been presumed that Trajan, who overcame the Nabataean kingdom at the death of Rabbel II, decided to build the *VIA NIVA TRAIANA*, from Busra to Aila (Aqaba) via Petra, for the moving of the legions⁶. The *Leg III Cyr* is thus believed to have participated to the attack of the Nabataean kingdom on the South West side to occupy Petra, while C. Claudius Severus, governor of Syria was moving from the North to occupy Busra; he became the first governor of the new province between 107 and 115 at least⁷.

This graffito is only the fifth inscription mentioning the Third Cyrenaica Legion found in Petra (Sartre 1993: n° 19, 44, 52, and 61). Of the four published inscriptions, 1 is a graffito (*IGLJ IV, 19*), 1 in an honorary inscription (*IGLJ IV, 44*), and 2 are funerary inscriptions (*IGLJ IV, 52, 61*). Therefore, our new graffito is only the fifth mention of the *III Leg Cyr*, recovered in Petra.

- *IGLJ IV, 19*:

⁵See also Speidel 1977 for another point of view; on the beginning of the Provincia Arabia see especially Bowersock 1971, 1983; Kennedy 1980.

⁶A Nabataean fragmentary inscription found at Avdat, in the Negev, is dated to the “year two of the eparchy”, the official name of the Provincia Arabia in Nabataean (Negev 1963: n° 11).

⁷On the governors of Arabia, see Bowersock 1973; Sartre 1982.



Fig. 4.Id., fac-simile (M.-J. Roche)

ΓΚΥΡ

Fig. 5.Ib., fac-simile (M.-J. Roche)

ΓΚΥΡ

Third [Legion] Cyr[enaica]

This Greek graffito is known since the nineteenth century and has been mentioned several times⁸. F. Zayadine and Z. Fiema republished this graffito in 1986, and assured the interpretation as a Third Cyrenaica Legion graffito.

The letter Γ represent here the numeral 3, written III in Latin inscriptions; to distinguish the Greek letter from the figure, it is usually topped by a horizontal bar, which I could not recognize *in situ*⁹. The third letter of Cyr, P has almost faded and was not visible.

Greek inscriptions of the Third Cyrenaica Legion are rather rare, as the language of the Roman army was Greek; on a funerary inscription from Khirbet es-Samra, R. 033, the abbreviated TEP (for *tertia* in Latin) is used instead of TPITH, the normal Greek form¹⁰.

⁸Bibliography in Sartre 1993: n° 19, p. 52; mentioned in Brünnow & Domaszewski I, 1904, n° 5; cf. the article by Zayadine & Fiema 1986.

⁹On a Latin building inscription from Umm Quttayn, Hawran (Kennedy 2004, fig. 9.5, p. 84), the sign III is topped by a horizontal bar, not necessary in this case, as there is no ambiguity on the reading.

¹⁰Humbert & Desreumaux (dir.) 1998: 399, example of Latin numeral adjectives used in Greek inscriptions, under the influence of the Latin military vocabulary

This graffito, written on a resting place next to religious Nabataean cultic niches in the main sacred road to enter Petra, the Siq, dates probably from the beginning of the Roman occupation, around 107. The casual language of the Third Cyrenaica Legion coming from Egypt was Greek.

We do not know if the *Leg III Cyr* was engaged in the “Quietus War” in Judaea, in 117, at the time of the Jewish uprising in Cyrenaica and Egypt, from 115 to 117, which spread also to Cyprus and Judaea¹¹.

The other Latin inscriptions are not dated.

• *IGLS XXI, 44:*

Fragmentary altar with Latin inscription written on three sides:

- 3 [Pro sal(ute) Imp(e)ra[toris]
 milites
 leg(ionis) III (C)yr(enaicae)
 1 coh(ortis) Au(reliae)
 M(arcus) Valen[--
 F(aciendum) c(uravit)
 2 M(arcus) Ulp(ius) Λ[--
 Ca(aius) Iul(ius) [.]O[--

This dedication was made by a legionary whose name was one of the emperors: Marcus Aurelius, Lucius Verus, or Caracalla. Therefore, this inscription cannot be dated before Septimus Severus (Sartre 1993: 72.).

One notices the monogram of Cyrenaica, lacking the C, and the Y and the R forming a *nexus* (*infra*)¹².

• *IGLS XXI, 52:*

Latin funerary inscription:

C.ANTINIVSVALENS
 EQV.LEGIII.CYR
 >IPRO VITIANIVIX

¹¹On these events, see in particular Eck 1999.

¹²Cf. Oleson, Reeves & Fisher 2002, on the Humayma Inscription.

.AN.XXIV.MIV.H.S.

C(aius) Antonius Valens, / equ(es) leg(ionis) III Cyr(enaica), / (centuria) [..]provitiani (?), vix(it) / an(nos) XXIV, mil(itavit) V or m(enses) IV. H[ic] s(sepultus) or s(itus est).

This inscription was found in the vicinity of Petra. The reading of lines 3 and 4 is uncertain. The name of the legionary is frequent in Egypt in the 1st century and first half of the 2nd century AD. Therefore this text could belong to the beginning of the 2nd century (Bennet & Kennedy 1978). But according to M. Sartre, the palaeography is later, and he suggests the 3rd century.

• *IGLJ* IV, 61:

Fragment of a Greek funerary inscription:

 --]I[.]KYP[--
 --]ZHΣEN[--
 --]THIB

This is a fragment of the funerary inscription of the child of a soldier of the Third Cyrenaica Legion, stationed in Busra.

Mentions of the Third Cyrenaica Legion in Humaymaf and Hegra

These inscriptions from Petra mentioning the Third Cyrenaica Legion are not testimonies of its permanent settlement in the ancient Nabataean capital. Indeed, the legion is stationed in Busra¹³, but with some forts in the an-Namara region, East of Busra¹⁴; several Latin and Greek inscriptions were found in the ancient province of Arabia (See Kennedy 2004; Kennedy (ed.) 1996.).

Among the places where the legion was stationed, one should mention especially Humayma in the Hisma, and Hegra at the southerner frontier. In fact, inscriptions from these two sites add an *aclamatio* to the name of the *Leg III Cyr*.

¹³On the Third Cyrenaica Legion in Busra, cf. Kindler 1983; Sartre 1985.

¹⁴On the status of an-Namara, cf. Macdonald 2008.

An abbreviated form appears on an altar broken in two parts, dedicated at Humayma, in the Hisma. It reads lines 3-4 (on two parts) (Oleson, J.P., Reeves M.B., Fisher B.J. 2002):

LEG III CYR

FEL.

The authors suggest *felix* or *feliciter*.

Another example from Hegra has been recently published, Latin inscription 35004_i06, line 2¹⁵:

IIICYRFELICIT[E]R

The authors translate:

The 3rd Legion Cyrenaica, congratulations!

Three soldiers of various ranks, of the *equites dromedarri*, are offering the dedication. Notice must be made of the three drawings, rather crude, engraved on the top of the inscription: a palm and two laurel wreaths, all symbols of victory, probably decorations awarded to the three legionaries; therefore It is better to interpret FELICITER as *anacclamatio*,¹⁶ an allusion to a conflict in which the legion was successfully engaged. We do not know the date of the inscription, and I suggest The Bar Kochba War.

The Inscriptions from an-Namara

In another place, namely at an-Namāra, in the ancient Trachon, in northern Ḥawrān, at the eastern side of the modern Jabal al-‘Arab, a graffito known since the XIXth century mentions the Third Cyrenaica Legion (Wadd 1870, 2281, p. 524 (copy of M. de Vogüé, erreur ill. p. 526); Wetzstein 1863, n°5 (also 7 and 8); Macdonald 2008, p. 320, n. 10, fig. 13b, p. 330. Sartre 2016). The full three lines

¹⁵Villeneuve 2015: 37-38, fig. 34, in Laila Nehmé, Wael Abu-Azizeh, Thomas Bauzou, Caroline Durand, Jérôme Rohmer, et al. Report on the Fifth Season (2014) of the Madâ'in Sâlih Archaeological Project. 2015. <halshs- 01122002> , p. 37-38, fig. 34; the legion is mentionned in two other inscriptions, fig. 35 and 38.

¹⁶I thank my colleague Raphaël Nicolle for his suggestion.

inscription is easily legible, ending with a particular acclamation, *Feliciter Invita (sic)*¹⁷. However, the drawing of a much probable leopard above the Latin text, and a complex monogram below it add more information as well as questions about their presence. The interpretation of these features can help understanding the historical context of the Petra graffito.



Fig. 6. Latin graffito at an-Namara, South Syria, Wadd.2281 (fac-simile M.-J.Roche).

[drawing of a leopard]

LEG III CYR

FELICITER

INVITA

{TRIVNPHS}

Third Cyrenaic Legion

Fortunately

Unconquered

{Triumph!}

The third line has two errors: the N is inverted, while the C is missing in the word INVICTA.

The fourth line is a monogram. The letters THR form a *nexus*, like the letters IVN, and the letters PHS. The monogram can be decomposed and read as a mixed form of *triumphus* in Latin. The initial consonant *t-* is written as *th-*, by confusion

¹⁷These inscriptions have recently been re-examined by M. Sartre, 2016; the author mentions two graffito of the III Leg Cyr, with the photo of one cited by Wetzstein (n° 5) and by Waddington (n° 2281), cf. Sartre 2016: 49-50.

with the Greek spelling of θριαμβος, “triumph” in Greek; the *r* has rather the form of Greek *rho*; the *m* is written *n*; the oblique bar means that the word is abbreviated, and indeed it lacks the letters *u*, eventually read as *o*¹⁸.

The drawing

Over the Namara inscription Wadd. 2281, is the drawing of a leopard facing left (*Panthera pardus orientalis*) (Mascle 1936: 100, fig. opp. p. 111, bottom). A very close drawing of this felid can be found on a Safaitic inscription from Wadi al-Ġuṣayn in eastern Jordan (Ababneh 2005, n° 976).

In the two drawings reproduced below (fig. 7), the long tail is figured turned upward over the body. Other examples of leopards drawings can be found in the Safaitic corpus of inscriptions by M. Ababneh (Ib.: 70, fig. 44). In Arabic, “leopard” is named *namir*¹⁹; the name given to the site, an-Namara, suggests the ancient presence of these felids.

The drawing could therefore be an allusion to a beast well known by soldiers of local origin, rather than some sort of Roman *insigna*.



Fig. 7. Graffiti of leopards: Wadd. 2281 and Ababneh 976 (fac-simile M.-J. Roche)

Interpretation

The Third Cyrenaica Legion was totally moved from Egypt to Arabia sometime after the creation of the *Provincia Arabia* (106 AD), and probably after the Parthian War was it installed in a fort at Busra, the capital of the province²⁰.

¹⁸On the different forms of Latin nexus (two and three letters written together), cf. Cagnat 2002: 24-26; cf. also Lassère 2005.

¹⁹Wehr 1979: sg. *namir*, pl. *numur*, *anmār*, *numūr*.

²⁰On the Third Cyrenaica Legion, cf. Kindler 1983:87-92; Wolff 2000; Gatier 2000; it was most probably the legion who occupied the southern part of Nabatene in 106 (*contra* Speidel 1977).

The *acclamatio* FELICITER INVICTA and the monogram TRIUMPHUS, which are engraved by the soldiers of the Third Legionary Cyrenaica, can be interpreted as allusions to the awards they received for their participation to the Bar Kochba War.

Our principal source on the Second Jewish War is Dio Cassius (in Xiphilin), 69, 13-14,3.

At first the Romans took no account of them (= of the rebellious Jews). Soon, however, all Judaea had been stirred up, and the Jews everywhere.....were gathering together, and giving evidence of great hostility to the Romansmany outside nations, too, were joining them through eagerness for gain, and the whole earth, one might almost say, was being stirred up over the matter. Then, indeed, Hadrian sent against them his best generals. Foremost among these was Iulius Severus, who was dispatched from Britain, where he was governor, against the Jews.

According to W. Eck, Haterius Nepos received the *ornamenta triumphalia* for its participation to the Bar Kochba War (Eck 1999. 223-227):

Only from the time of Augustus, when only the emperor could celebrate a triumph, generals who had undertaken a triumph-worthy campaign were given the *ornamenta triumphalia* as compensation. According to the available sources, this happened for the last time during the reign of Hadrian following the war against Bar Kochba.

[...] It is precisely because Hadrian accepted *imperator II* after the Bar Kokhba revolt, thereby making it clear that this victory was worthy of a triumph, that he could honour his generals in this war with *ornamenta triumphalia*. The Emperor was legally and politically the victor, and his generals could participate in his glory.

The origin of the Roman soldiers who left their names on the rocks of an-Namara was mostly local, as evidenced by the mention of Hawran villages from which they come. As M.C.A. Macdonald points out, they were locally recruited: "So it may be that these men were chosen for their local geographical, social, and possibly linguistic knowledge" (Macdonald 2008, p. 320); he suggests also that the building of such a small fort was, as in other places, to control *maḥāḍir*, or semi-permanent sources of water, on which the nomads relied during the dry

season ((*al-qayz*) after the pastures has dried up, and to which they gather to wait until the October rains" (Ib., p. 321).

The new Latin graffito from Petra and the an-Namara more complex inscription can both be related to the same historical event, the crushing of the Second Jewish Revolt at the time of Hadrian. As brilliantly demonstrated by W. Eck in 1999, "Hadrian accepted for the first time an imperial acclamation for a military victory"; this made possible the *ornamenta triumphalia* given to three generals engaged in the operations; among them, Haterius Nepos, who remained in the Province of Arabia after his consulate, as a Gerasa inscription testifies; he mentioned the *ornamenta triumphalia* in an inscription from Pannomia, but this title cannot refer to his years in this province, as W. Eck explains. So, this title is only referring to the Second Jewish War, which led Hadrian to draw troops from outside the Judean province, namely from Syria and Arabia (Eck 1999).

The mention of Haterius Nepos as a tyrant in a Safaitic inscription (Abbadi & Zayadine 1986) may be an allusion to forced enrolment into the Roman army.

The *acclamatio*, FELICITER INVICTA, was much probably given to the legion for its role in the Roman victory.

The complex monogram under the an-Namara Inscription Wadd.2281 can only be in relation with it, in an allude style: THRIVNPHS, a mixed Graeco-Latin monogram referring to the *ornamenta triumphalia* given to Haterius Nepos.

Therefore the new Latin graffito found at the Dayr at Petra can be dated to the years following 136 AD.

Sigla and References

IGLS= Inscriptions grecques et latines de la Syrie, IFPO, Beyrouth, Damas, Amman.

IGLJ= Inscriptions grecques et latines de la Jordanie, IFPO, Beyrouth, Damas, Amman.

BAH= Bibliothèque archéologique et historique, IFPO, Beyrouth, Damas, Amman.

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NEOLITHIC SHKĀRAT MSAIED - LATEST RESULTS

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Abstract

The Neolithic site of Shkārat Msaied is under excavation since 1999 by a Danish team of the University of Copenhagen. During the last seasons we have focused on building unit F and its surroundings. Unit F contains a series of burials offering striking insights into the PPNB mortuary practices. The contribution presents the fieldwork and research carried out at the site in recent years. Shkārat Msaied is one of the PPNB sites in the Petra area showing the transition from round to rectangular buildings and the use of the “vertical” space highlighting the long building tradition in the region.

Introduction

The Early-/Middle-Pre-Pottery Neolithic B site of Shkārat Msaied (ca. 0.1 ha) is located approximately 16 km north of Petra/Wadi Musa in southern Jordan and is in close proximity to other well-known Early Neolithic sites such as Ba’ja and Beidha. Excavations at the site began in 1999; from 1999 to 2001 as a field school project of the Carsten Niebuhr Institute (Kalizan et al. 2001) and later on as a research excavation project (2002 to 2005, and from 2010 onwards) by the Department of Cross-Cultural and Regional Studies, University of Copenhagen in close co-operation with the Jordanian Department of Antiquities and the Carlsberg Foundation (Jensen et al. 2005; Hermansen et al. 2006; Kinzel et al. 2011, 2015, 2017).

In the thirteen seasons of excavation approximately 600 m² of early Neolithic architecture from six phases of occupation were exposed (Kinzel 2013). Phase 0 describes the occupation pre-dating the stone buildings at the site, lacking so far secure dates. According to 14C-dates Phases I to III span the first half of the Middle Pre-Pottery Neolithic B (hereafter MPPNB, ca. 8250 to 7950 calBCE,

Jensen et al. 2005, 116; Hermansen et al. 2006; cf. <http://shkaratmsaied.tors.ku.dk/>). Phase IV is dated to the Late Neolithic and Phase V represents the Nabatean / Roman Period (Kinzel 2013).

In the MPPNB Shkārat Msaied is characterized by circular buildings of various sizes; between 5 m² and 27 m² (Fig.1). More than 25 circular buildings have been identified and provide evidence of complex and long lasting use histories (Jensen et al. 2005; Kinzel 2013).

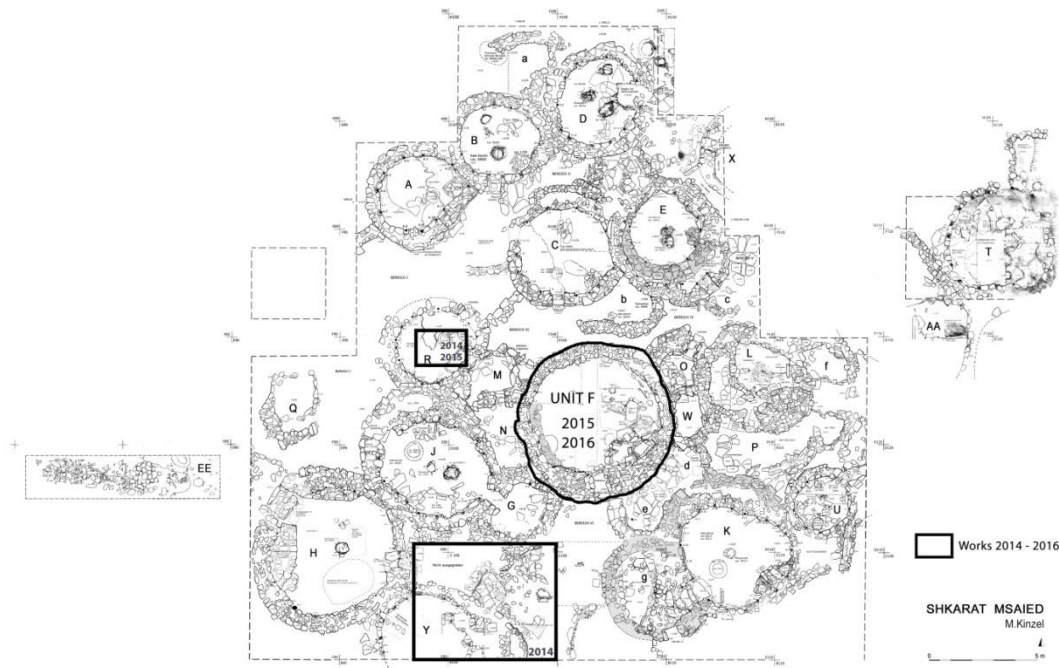


Fig. 1 Shkārat Msaied site plan with 2014 - 2016 work areas marked (University of Copenhagen/M.Kinzel).

The main objective in the last three excavation seasons was to consolidate the exposed architecture which had been affected by heavy winter rains and damaged by illicit diggings and vandalism reported in 2013. One of the looting pits in Unit R was used to investigate the earliest occupation and the beginnings of the settlement (Architectural Phase 0, cf. Kinzel 2013) by investigations the occupation deposits below the known architecture. Excavation continued as well in Unit F which served as a communal burial ground (cf. Hermansen et al. 2006; Kinzel et al. 2010; Kinzel et al. 2017). Other investigations concerned the excavation of the southern area to clarify the functional and spatial relations of the area south of Unit F (Kinzel et al. 2015). In 2015 we returned to Unit F for further investigations. We continued excavating the interior of the unit removing

later floors, walls and fill-material to expose fully an earlier plaster floor (Loc. 120.120) to identify remaining, additional burials. This was also meant to clarify the stratigraphic context in the building.



Fig. 2 Shkārat Msaied 2016, Unit F: 3D-model with Locus-numbers. Hatching:= misplaced stones; QR-code link to 3D-model (prepared by M.Kinzel).

Unit F

The complex stratigraphy of Unit F (Fig.2) reflects its long use history. The building shows traces of at least four main building phases within a number of modifications and repairs were carried out. This makes it almost impossible to define sub-phases. However, we can describe the stratigraphy of Unit F in a condensed way as follows (cf. Kinzel 2013; Kinzel et al. forthc.):

1) Unit F is built as a freestanding round house structure comprising a single space. The entrance (Loc. 120.134) is oriented towards SE. A lime plaster floor (Loc. 120.120) covers the entire interior of the building; a plaster “basin” (Loc. 110.130) is located in line with the doorway. Into this plaster floor some of the larger burial cists are inserted. It is not possible to say when the burial cists were built.

2) On the plaster floor (Loc. 120.120) we find the remains of a collapsed roof (Loci 110.137/138) covering some articulated placed animal remains as well as ground stones. The layer is very densely packed.

3) The roof collapse material is covered by hard packed “fill” material which also runs over the cut exterior wall (Loc. 110.111) of Unit F in the western part of the building.

4) A plaster floor (Loc. 90105/110.119) is placed on the hard compacted fill material and covers the entire house interior (covering also the earlier plaster feature). In the floor most of the child burials are interred. The relationship to the larger burial cists is unclear as the burials are mainly covered by a multi-layered and disturbed pavement (Loc. 90109/110) which is partly embedded or over-laid by this floor. On this floor the wall (Loc. 110.107/70209) was erected closing off the earlier entrance (Loc. 120.134).

5) Several layers of various plaster surfaces and repairs (Loc. 60114; 60110) underlying the plaster floor (Loc. 60100/-104/-105/80203).

6) Course plaster floor (Loc. 60100/-104/-105/80203) of a late phase of Unit F. The floor is related to the doorway oriented towards south (Loc. 120.133). It shows also a plaster feature (Loc. 80202) with a raised rim and a shallow basin.

7) A layer of mixed fill material, most probably stemming from a roof collapse.

8) Hard packed mud floor (Loc. 50109) covering most of the interior of unit F. On the rim of the plaster feature (Loc. 80202) stones are placed to mark a later fire place (Loc. 50103/50110). The Interior of the late Unit F is divided into three spaces by low partition walls (Loci. 50124/125 and 50123) transforming the central area into a rectangular space. In the floor some larger ground stones were embedded.

The investigation in Unit F revealed a number of primary, secondary and tertiary burials as well as new information on the earlier use phases of Unit F and the

remains of an older building (as partly explained above). East of the entrance to Unit F (Loc. 120.134) a stone cist (Loc. 110.108) containing three skulls (Fig.3) was recovered at the bottom of wall Loc. 70.209 (Kinzel et al. 2016). This feature is very similar to skull caches from other Neolithic sites such as) Tell Ramad (Ferembach 1969), Jericho (Kenyon & Holland 1981:77), 'Ain Ghazal (Griffin et al. 1998, or Yiftahel (Slon et al. 2014). But the skulls from Shkārat Msaied do not show any traces of plastering or modifications. The plaster floor (Loc. 90105/110.119) was cut in order to build the stone cist. South of the skull deposit (Loc. 110.108) another stone feature (Loc. 110.109) was discovered which contained the remains of at least two foxes (*Vulpes sp*) and might indicate a very close relationship between human and animal remains. Animal bones (although mostly goats, i.e. *Capra aegagrus* or *Capra ibex*) were often found in close association with human remains, or were deposited along the wall of Unit F.



Fig. 3 Shkārat Msaied, Unit F: Skull from skull cache (Loc. 110.108) found in 2015.

An entrance (Loc. 120.134); approximately 65 cm wide; of an earlier use phase of Unit F was identified just east of the later entrance (Loc. 120.133) after wall Loc. 110.107 (same as Loc. 70209) was removed. As wall Loc. 110.107 was built this entrance became blocked and integrated into a niche-like feature (Loc. 2261). The lime plaster floor (Loc. 110.138/120.120), which was exposed throughout the unit is obviously related to this earlier building phase. A plaster “basin” (Loc. 110.130) - as common for most (domestic) buildings at Shkārat Msaied - was found in the axis of the former entrance (see as well Hermansen & Jensen 2002). The plaster basin was filled by a white-greyish powdery chalky material (Loc. 110.132) without showing traces of charcoal or charred material. A flint cache (Loc. 110.133) was found in the basin (Fig.8). The cache consists of seven bidirectional blades and is the first flint cache found at Shkārat Msaied. Three of the blades were tooled into Jericho-points (Fig 9). All the blades and projectiles were manufactured from two flint types (FRMG 6 and FRMG 2), which are not attested within the geological environment of the Greater Petra Region (Purschwitz 2013, in prep b) but are commonly used for core reduction at Shkārat Msaied and at the contemporary site of Beidha (Purschwitz 2017a, 2017b; Mortensen 1988; cf. Barzilai 2010). The plaster basin (Loc. 110.130) and the flint cache were sealed with clayish mortar material (Loc. 110.131) at a later point. This took place before the roof collapsed and fill material was compacted to establish the next layer of plaster floor (Loc. 90105/110.119). In the southern part of the room roof collapse (Loc. 120.104/ 110.137) was found on the earlier floor level (Loc. 120.120) and confirmed the materials and construction methods attested by the roofs in other buildings (e.g. Unit K) at the site. Two pestles and a hammer stone were found in situ on the floor surface, indicating perhaps some normal day-to-day processing of food.

A wall, which belongs to an earlier building (W Loc. 110.111) was exposed in the western part of Unit F. Although it seems to form a bench-like feature/platform; it can be seen as the remains of an early building phase of Unit F with a slightly smaller size. The earlier building might have been demolished and the exterior wall was cut down to the preserved height. All the larger burial cists were cut into the earlier plaster floor (Loc. 110.138=Loc. 120.120) and covered by the pavement in the eastern part of the building (Loc. 90109/90110). Most of the

child burials seem to be associated with a later plaster floor (Loc. 90105/110.119) but the burials may still have been contemporary.



Fig.4 Unit R and the looter's pit under excavation in 2015 (University of Copenhagen/ M.Kinzel).

Below Unit R

Unit R is a “domestic” building in the western part of the trench (Fig.4). In 2010 a child burial was exposed just north of a stone box feature. It seems to be interred when the building already was abandoned and in disrepair. Located north of Unit J and west of Unit M it formed the southern limits of the open space “area I”. The walls of Unit R are badly preserved and only a few stones of the wall base are still demarcating the limits of the interior.

In 2013 an illicit pit was dug in the south-eastern part of Unit R cutting the stone cist and partly undercutting the building's exterior wall. The looting pit was dug about 1.5 m into the occupational deposits below Unit R. The back-dirt of the pit showed an extraordinary density and richness of artefacts and “ecofacts”. Among others abundant land snails, few marine mollusc shells (Abu-Laban, pers. Comm.), flint artefacts and tools (e.g. some Jericho-points), worked and

unworked bones as well as sandstone beads in various stages of production were found. The majority of animal bones are from goats (both *Capra aegagrus* and *Capra ibex*), but also bones of fox (*Vulpes* sp.) and bird bones are well represented (Nielsen in prep.). Among the bird bones the third phalanges (talons) of raptors are particularly numerous and may indicate that these parts of birds may have had some ritual significance at Shkārat Msaied.

The section of the cleaned looting pit showed in its upper part a sequence at least five, probably six, plaster floors, which alternate with occupational deposits (Fig. 2-3) and illustrate the complex and long lasting use history of Unit R. The lower sequence, which appears to predate Unit R, is characterized by a sequence of deposits that are generally ashier, often with spots of charcoal and burnt lumps of clay, and are marked by a high density of finds. A series of light brownish-reddish hard packed surfaces could be traced between the various layers of heterogenic roof (?) collapse material. In the lower sequence of the stratigraphy a dense concentration of land snails and (a few) marine mollusc shells was found embedded in a greyish-white ashy layer (see also Abu-Laban 2014).

Conclusion

Since the excavation at Shkārat Msaied have started in 1999 the site has contributed significantly to our knowledge about the early Neolithic. The finds and findings at Shkārat Msaied have challenged results from Beidha and other sites in the Petra region in many ways, but at the same time widened our perception of the Neolithic world. The PPNB-buildings at Shkārat Msaied are exceptional examples for the regional development of orthogonal concepts in architecture. With its unique burials found in unit F the site contributes to our understanding of mortuary practices during the PPNB and the formation of group identities as well as the emergence of religion and ritual spaces in the Petra-region.

In preparation of a final publication, covering the work since 1999, additional fieldwork is planned for 2018/19 to fully excavate Unit F. In 2015 the team was joined by the Greenlandic artist Nuka Godtfredsen to produce visuals of research results in the form of (graphic novel) scenarios to discuss findings and contexts. In 2017 we received two grants by the Danish Ministry for Education and

Research as well as of the Danish Institute in Damascus to support this initiative to disseminate our research results. Project data is made available through our website <http://shkaratmsaied.tors.ku.dk/>; including 3D recordings of buildings, time-lapse recordings of excavation works, and reports. In addition to the presentation of scientific results it is planned to undertake further preservation measures and to prepare the site for visitors in the context of the Neolithic Heritage Trail.

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BADIA NEOLITHIZATION IN SOUTHERN JORDAN: A BRIEF REVIEW FROM CURRENT RESEARCH IN THE JAFR BASIN

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Abstract

Since the first field season in 1997, we have continued comprehensive investigation in the Jafr Basin in an effort to trace the formation process of the nomadic society in southern Jordan. The series of research outcomes was recently synthesized in the form of the Jafr chronology, which has enabled us to outline the key episode in a sequential way. However, available datasets are still patchy, and a few chronological gaps remain to be filled.

This paper briefly reviews the results of subsequent investigations designed to develop the details of the first half of the chronology. We excavated the following four Neolithic sites: the PPNA encampment of Harrat Juhayra 205, the EPPNB (Early Pre-Pottery Neolithic B) settlement of Harrat Juhayra 202, the M-LPPNB rockshelter settlement of Jabal Juhayra, and the LPPNB/PPNC transitional encampment of Hashm 'Arfa. The series of new excavations has provided valuable insight into the Badia Neolithization in southern Jordan.

1. Introduction

Since the first field season in 1997, we have continued comprehensive research in the Jafr Basin with a view to tracing the formation process of the nomadic society in southern Jordan. The sites excavated to date amount to a few dozen, ranging in content from M-LPPNB (Middle to Late Pre-Pottery Neolithic B) agro-pastoral outposts and barrage/cistern systems, through PPNC/LN (Late Neolithic) encampments and open-air sanctuaries, to Chalcolithic/EBA (Early Bronze Age) burial fields and flint quarries. The series of research outcomes was

synthesized in the form of the *Jafr chronology* (Fujii 2013), which has enabled us to outline the process of the Badia Neolithization in southern Jordan more or less sequentially. However, available information is still limited, and many issues remain to be discussed.

This paper briefly introduces the results of subsequent investigations designed to develop the details of the Jafr chronology, especially its first half. We dealt with the following four Neolithic sites. To begin with, the excavations at Harrat Juhayra 205 and 202 revealed that the Neolithization in the basin dates back to the PPNA or at least the very beginning of the EPPNB. Second, the finding of a built-in pier-house at the rockshelter settlement of Jabal Juhayra corroborated anew our previous perspective that the M-LPPNB pastoral transhumance in the basin derived from farming communities to the west. Third, the rescue excavation at Hashm 'Arfa exemplified that PPNB well-organized outpost complexes were replaced with PPNC/LN simple encampments in the course of pastoral nomadization (Fig. 1). It is the objective of this short paper to review the process of Neolithization in the Jafr Basin on the basis of the results of the current research.

2. Harrat Juhayra 205

Harrat Juhayra 205 is located on a gentle slope at the southeastern corner of a basalt plateau that extends eastward from the foot of Jabal Juhayra, an isolated volcanic hill behind Jurf Darwish. The excavation took place in August 2016 (Fujii, Adachi, Nagaya n.d.d).

This small site consists only of a curvilinear masonry wall *ca.* 4 m long and *ca.* 0.3-0.4 m in preserved height (Feature 1) and two small stone circles *ca.* 0.8-1 m in outer diameter (Features 2 and 3) (Fig. 2: 1; Fig. 3). The former was constructed by a double-faced, rubble core technique and reinforced by a low facing wall attached to its southern side. Undressed basalt cobbles up to *ca.* 30 cm long were used as major building materials. This simple wall was probably used as a windbreak for a short stay. Meanwhile, the two small stone circles were lined with a single row and course of upright (or originally upright) basalt slabs, but nothing was included inside. In terms of stratigraphy, all the three features were based on a basalt bedrock layer (Layer 5) or its weathered soil (Layer 4),

being covered with Layers 3-1 deposits. In addition, four small, semi-anthropogenic depressions (Depressions 1-4) up to *ca.* 0.5 m deep were found on the exposed bedrock layer behind the windbreak wall. They were possibly used for storing runoff surface water. A similar, yet much larger, example has been found at the below-mentioned EPPNB settlement of Harrat Juhayra 202, suggesting that the management of runoff surface water has already developed to a certain level in the early Neolithic Jafr basin.

This small complex yielded some seven thousands chipped flint artifacts and a dozen groundstone implements. The chipped flint assemblage is characterized by the combination of bladelet tools represented by el-Khiam type points (Fig. 3: 2-7) and robust flake tools including transverse-blow axes/adzes (Fig. 3: 9-10) and large bifacial knives (Fig. 3: 11-12). As for core class products, single-platform blade/bladelet cores are predominant, and no naviform cores are attested. The assemblage includes a Hagdud truncation (Fig. 3: 8) and two small obsidian flakes as well (Fig. 3: 13-14), the latter of which turned out to have been transported from the Göllüdag East source in eastern Anatolia (Campbell *et al.* 2017). Meanwhile, the groundstone assemblage consists of several pestles and a grooved whetstone. Neither querns nor grinding slabs are included.

Although no C-14 data are available, the flint assemblage marked by the predominance of the el-Khiam points and the tranchet axes/adzes, on one hand, and the absence of the naviform cores, on the other hand, can be dated to the PPNA without doubt. Both the small site size and the scarcity in artifact variety imply the involvement of a small-scale, high-mobility population group. This site probably represents their seasonal encampment probably doubling as a temporary flint workshop.

3. Harrat Juhayra 202

This site occupies a relatively flat terrain *ca.* 100 m west of Harrat Juhayra 205. The excavation is still in progress. The following description will deal only with the research outcomes in the first excavation season taken place in August 2016 (Fujii, Adachi, Nagaya *op. cit.*).

The excavation in Area 1 revealed a small structural complex (Complex I) that consists of a ground-type, masonry dwelling (Structure 1) and a rock-cut, open-

air water-catchment facility (Cistern 1) (Fig. 2: 2; Fig. 4). Structure 1 is a relatively large feature with an oval plan, measuring *ca.* 6-8 m in outer diameter, *ca.* 0.6-1.1 m in wall thickness, and up to *ca.* 0.5 m in preserved wall height. As with the neighboring Harrat Juhayra 205, the masonry walls are constructed by a double-faced, rubble core technique, and a low reinforcement wall is attached to its southern, lower-in-elevation side. As for construction materials, undressed basalt cobbles up to *ca.* 50 cm long are used together with clay mortar and basalt rubble of varied sizes. A narrow, stepped entrance opens at the southeastern corner, leading to a forecourt protected with a curvilinear windbreak wall *ca.* 6.5 m long. Typologically, this structure is essentially of a single-room type, but an oval compartment leading from a narrow passage is incorporated into its northwestern corner. A small hearth (Hearth 1) *ca.* 35 cm in diameter and *ca.* 10 cm deep was found on the easterly floor, around which traces of plaster-like floor pavement were confirmed.

The rock-cut cistern is located behind the windbreak wall. It is irregular in general plan, having a mouth area of *ca.* 6 m by *ca.* 2.5 m, a floor depth of *ca.* 0.6-1 m, and the maximum storage capacity of several cubic meters. This small water catchment facility is constructed taking advantage of a natural depression on the exposed basalt bedrock layer, but traces of pulling out cracked rocks and enlarging natural water channels are recognized at several loci. Furthermore, a stone-capped, gravelly bank *ca.* 0.6 m high and at least *ca.* 4 m long is attached to the southern, lower-in-elevation edge of the depression. This bank was probably combined with the northeastern wall of Structure 1 to dam up overflow stream from the depression. This semi-anthropogenic cistern can be regarded as a developed form of the primitive examples at Harrat Juhayra 205, on one hand, and a proto-type of full-scale cisterns excavated at the M-LPPNB outposts of Wadi Abu Tulayha (e.g. Fujii 2009a, 2010, 2014), Wadi Ghuwayr 17/106 (Fujii, Quintero *et al.* 2011; Fujii, Adachi, Quintero *et al.* 2011), and Jabal Juhayra, on the other hand.

Small finds recovered from the complex are poor in variety, being limited to some fifteen thousands chipped flint artifacts, four obsidian flakes, and a few dozens groundstone implements only. The scarcity of artifact variety is characteristic of the Jafr PPNB that developed in the arid periphery and common to the sites

referred to above as well. The flint assemblage is marked by the survival of el-Khiam type points (Fig. 4: 4-6), the predominance of Helwan type points (Fig. 4: 7-9), and the appearance of small, bidirectional, tongued points (Fig. 4: 10-12). Our preliminary attribute analysis suggests that most of the tongued point derived from naviform cores (Fig. 4: 3) that also first appeared at this site (Fujii, Adachi, Nagaya n.d.c). Other tool class products include tranchet axes/adzes (Fig. 4: 16-17), large knives (Fig. 4: 14), serrated blades (Fig. 4: 13), retouched flakes, retouched blades/bladelets, scrapers, notches, and burins. As with Harrat Juhaya 205, the bimodal combination of the bladelet-based delicate tools and the flake-derived robust tools marks the assemblage.

Meanwhile, the groundstone assemblage contains a shaft-straightener, two basalt mortars with a central depression, and eight basalt and green stone pestles of various forms. The combination of cup-hole mortars and pestles, instead of querns and grinding slabs, suggests that as is partly the case of the chipped flint assemblage, the groundstone assemblage at the site still stayed within the framework of the PPNA lithic industry.

Nine C-14 data from the complex and its surrounding loci equally converge on 9000-8600 calBC, indicating that the site dates back to the beginning of the EPPNB (Fig. 7). The distribution range of surface finds suggests that it extended southeastward to form a small, outpost-size settlement less than 1 ha in total area. Subsequent excavations are expected to shed light on the overall picture of the EPPNB settlement first found in the Jafr Basin.

4. Jabal Juhayra

The site of Jabal Juhayra is located *ca.* 5 km west of the two Neolithic sites mentioned above, occupying steep slopes beside a small gully that dissects the southeastern flank of the isolated volcanic hill of the same name (Fig. 2: 3). It is now in danger of disappearance due to the industry-level scoria mining. Our intensive rescue excavations, taken place over five successive seasons from September 2014 until June 2016, revealed that the site contains two stratified rockshelter settlements (Fujii 2015, 2016; Fujii, Adachi, Nagaya n.d.b).

The highlight of the Layer 3 settlement, our main concern, is a rock-cut, built-in pier-house found in Rockshelter 6 (Fig. 2: 5; Fig. 5). This rockshelter dwelling,

measuring *c.* 6-7 m in frontage, at least *c.* 8-9 in depth, and *c.* 2-3 m in estimated ceiling height, is built by a unique technique of attaching masonry facing walls to the inner surfaces of the rockshelter modified in advance to a predetermined form. In terms of typology, it has a tripartite rectangular plan, being equipped with a gabled entrance and two pairs of buttress-like partitions attached to rock-cut protrusions prepared in advance. Thus the structure can be defined as a rock-cut version of the *pier-house* common to M-LPPNB settlements in the southern Levant (e.g. Byrd and Banning 1988). The remaining five rockshelter dwellings (Rockshelters 5-1) represent its simplified form, suggesting that the settlement started with the eclectic pier-house and developed northwestward.

Another highlight of the excavation is the finding of a stone-built barrage *ca.* 16 m in preserved wall length and a few dozen rock-cut cisterns of various forms and sizes. A few C-14 data and more than a dozen *in situ* artifacts found on their floor clearly demonstrate that the advanced water-catchment system and the six rockshelter dwellings were combined to form a well-organized settlement (Fig. 7).

The chipped stone assemblage from the Layer 3 rockshelter settlement is characterized by naviform core-and-blade components (Fig. 5: 1). The tool class products are dominated by Amuq-type points (Fig. 5: 2-5) and Badia points (Fig. 5: 6-9), being followed by robust denticulates (Fig. 5: 10), drills (Fig. 5: 11-12), serrated blades (Fig. 5: 13), angle or dihedral burins (Fig. 5: 14), side- and end-scrapers, and axes. In addition, heavy-duty digging tools made of large flint flakes or elongated basalt rods are also attested. They were probably used for digging the rock-cut cisterns and modifying the inner surface of the rockshelters. Meanwhile, unlike the Harrat Juhayra sites, the groundstone assemblage consists exclusively of querns and grinding slabs. Other stone products include stone vessels, flint bowlets (Fujii 2009b, 2012), stone weights, and whetstones. In addition, bone tools, shell/snail ornaments also occurred in small quantity.

The finding of the eclectic pier-house at the northwestern corner of the Jafr Basin corroborates anew our previous perspective that the initial pastoral transhumants in the basin derived from farming communities in the sedentary cultural sphere to the west. Incidentally, the six rockshelters were reused as a temporary campsite of the Layer 2 (LN/Chalcolithic transitional) pastoral

nomads who carried cortical knives (Fujii, Adachi, Nagaya n.d.a). Jabal Juhayra is the only stratified Neolithic settlement in the Jafr Basin and expected to serve as a warp that bundles patchy datasets so far collected.

5. Hashm 'Arfa

Unlike the other three sites, Khashm 'Arfa lies in the hilly terrain that fringes the eastern edge of the Jafr Basin. Our rescue excavation taken place in September 2013 revealed a small encampment that consists of three semi-subterranean structures (Units 01-03) and five ground-type, slab-lined, oval features (Fujii, Adachi, Yamafuji *et al.* 2017a) (Fig. 2: 4; Fig. 6). The former measured *ca.* 2-3 m in longer axis and up to *ca.* 0.6 m in floor depth, being lined with upright large limestone slabs. The latter, on the other hand, varied in size from *ca.* 0.5 m to *ca.* 2.5 m in longer axis and included ashy deposits.

The flint assemblage is eclectic in character, containing both typical PPNB components such as naviform cores and Amuq type points (Fig. 6: 1-4) and post-PPNB elements including large bifacial tools (Fig. 6: 8-10) and pressured-flaked bifacial spearheads (Fig. 6: 11-12). Meanwhile, the groundstone assemblage consists of a dozen grinding slabs, three bilaterally-notched stone weights, and a diagonally truncated stone bar. The latter two probably represent subsequent forms of the original products ubiquitous at the PPNB outposts in the Jafr Basin (e.g. Fujii 2013: fig. 13).

This small encampment *ca.* 0.1 ha in total area can be dated, on the basis of six C-14 data and the comparative studies of diagnostic finds, to the LPPNB/PPNC transitional phase (Fig. 7). The site offers a glimpse into the replacement process of the full-fledged PPNB outpost complex with the post-PPNB small encampment during the course of initial pastoral nomadization.

5. Discussion

The series of new excavations has contributed much to the refinement of the first half of the Jafr chronology (Table 1). To begin with, the excavations at Harrat Juhayra 205 and 202 have filled up a millennium gap between the Late Natufian settlement of Wadi Qusayr 137 (Fujii 2005b) and the M-LPPNB outpost of Wadi Abu Tulayha (Fujii 2006) and, by so doing, enabled us to start our discussion on

the Badia Neolithization with its initial stage. Among others, Harrat Juhayra 202 is an EPPNB settlement first excavated in southern Jordan and, together with related sites in the Jordanian Badia (e.g. Rollefson 1996; Rokitta-Kurmnov 2016; Stefanisko and Purschwitz 2016), has offered conclusive evidence for the existence of the EPPNB culture in the southern Levant. The two sites deserve continued attention in terms of the origin of a cistern as well.

Meanwhile, the Layer 3 rockshelter settlement at Jabal Juhayra proved to be the third example of the Jafr PPNB outpost complex following Wadi Abu Tulayha and Wadi Ghuwayr 16/107. Furthermore, the finding of the built-in pier-house has provided a key to approaching the issue of mother settlements of the Jafr outpost PPNB. The eclectic pier-house has much in common with those at the Beidha Layer 2 or Phase C settlement (Kirkbride 1966, 1967; Byrd 2005), indicating that initial pastoral transhumants in the basin derived from contemporary farming communities to the west. In addition, the site has offered a final conclusion on the dating issue of the barrage and cistern systems in the Jafr Basin. It is now indisputable that the Jafr PPNB outpost complex was equipped with an advanced water-catchment system consisting of a barrage and a cistern (Fujii 2007a, 2007b, Fujii, Adachi, Endo *et al.* 2012, 2013).

Hashm 'Arfa is highly important in that it offers a glimpse into the everyday life of early post-PPNB pastoral nomads thus far known at contemporary open sanctuaries only (e.g. Fujii 2000, 2005a; Fujii, Adachi, Endo *et al.* 2013; Fujii, Yamafuji *et al.* 2013b). Its eclectic flint assemblage appears to fall into an intermediate phase between the Dhuweila Stage 1 (represented by typical PPNB components) and Stage 2 (marked by the presence of Herzliya/Nizzanim points, transverse arrowheads, and tile knives) (Betts *et al.* 1998: 59-119). The site might have something to do with small, cistern-type barrages dotted in the eastern Jafr (Fujii, Adachi, Yamafuji *et al.* 2017b).

In addition, the Layer 2 (LN/Chalcolithic transitional) rockshelter encampment at Jabal Juhayra reminds us of Tell el-Hibr, a late Chalcolithic/EBI rockshelter occupation in the eastern Jordanian Badia (Betts 1992; Betts *et al.* 2013: 143-155). The frequency of rockshelter settlements/occupations in the Chalcolithic Badia implies that the tent life was not yet fully established at this stage.

6. Concluding Remarks

The new excavations have provided further insight into the Badia Neolithization in southern Jordan. The renewed Jafr chronology indicates that despite its seemingly poor archaeological potential, the basin has an almost uninterrupted occupational history during the early and middle Holocene. This paper addressed the first half of the long-term cultural sequence and filled up several chronological gaps including the PPNA and the EPPNB. The next paper is to deal with its second half.

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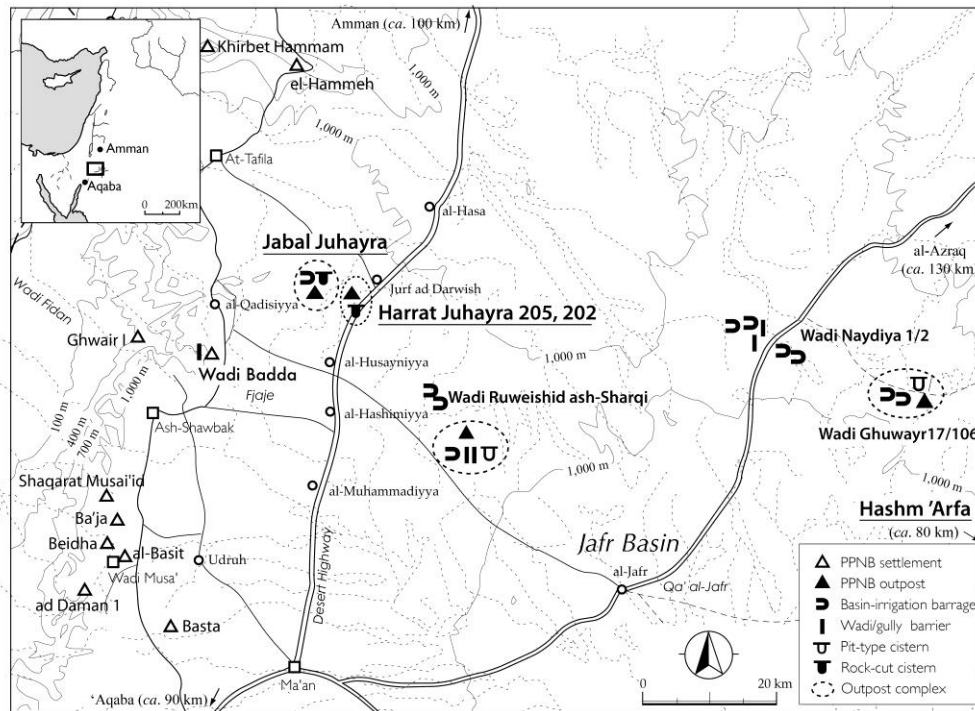
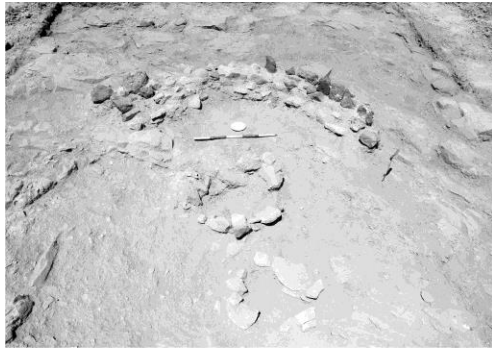


Fig. 1 Neolithic sites in the Jafr Basin and its surrounding area.



1. Harrat Juhayra 205: Features 1-3 (looking N).



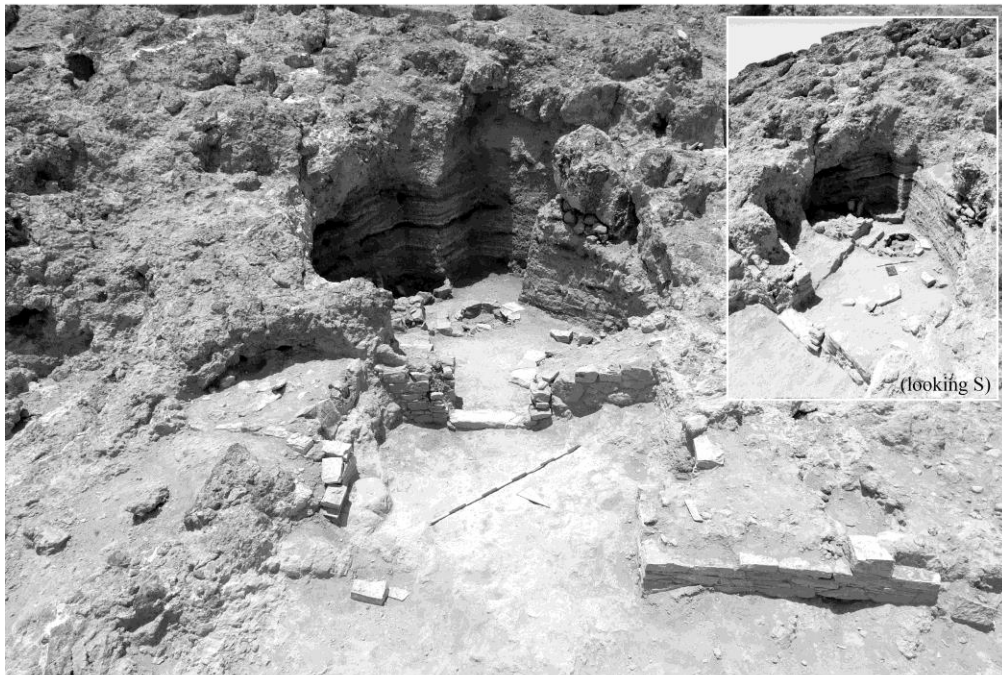
2. Harrat Juhayra 202: Complex I (looking N).



3. Jabal Juhayra: general view (looking W).



4. Hashm 'Arfa: general view (looking NE).



5. Jabal Juhayra: Rockshelter 6 (looking SW).

Fig. 2 New excavations in the Jafr Basin.

1. Harrat Juhayra 205: general view (looking N).
2. Harrat Juhayra 202: Complex I in Area I (looking N).
3. Jabal Juhayra: general view (looking W).
4. Hashm 'Arfa: general view (looking NE).
5. Jabal Juhayra: Rockshelter 6 (looking SW).

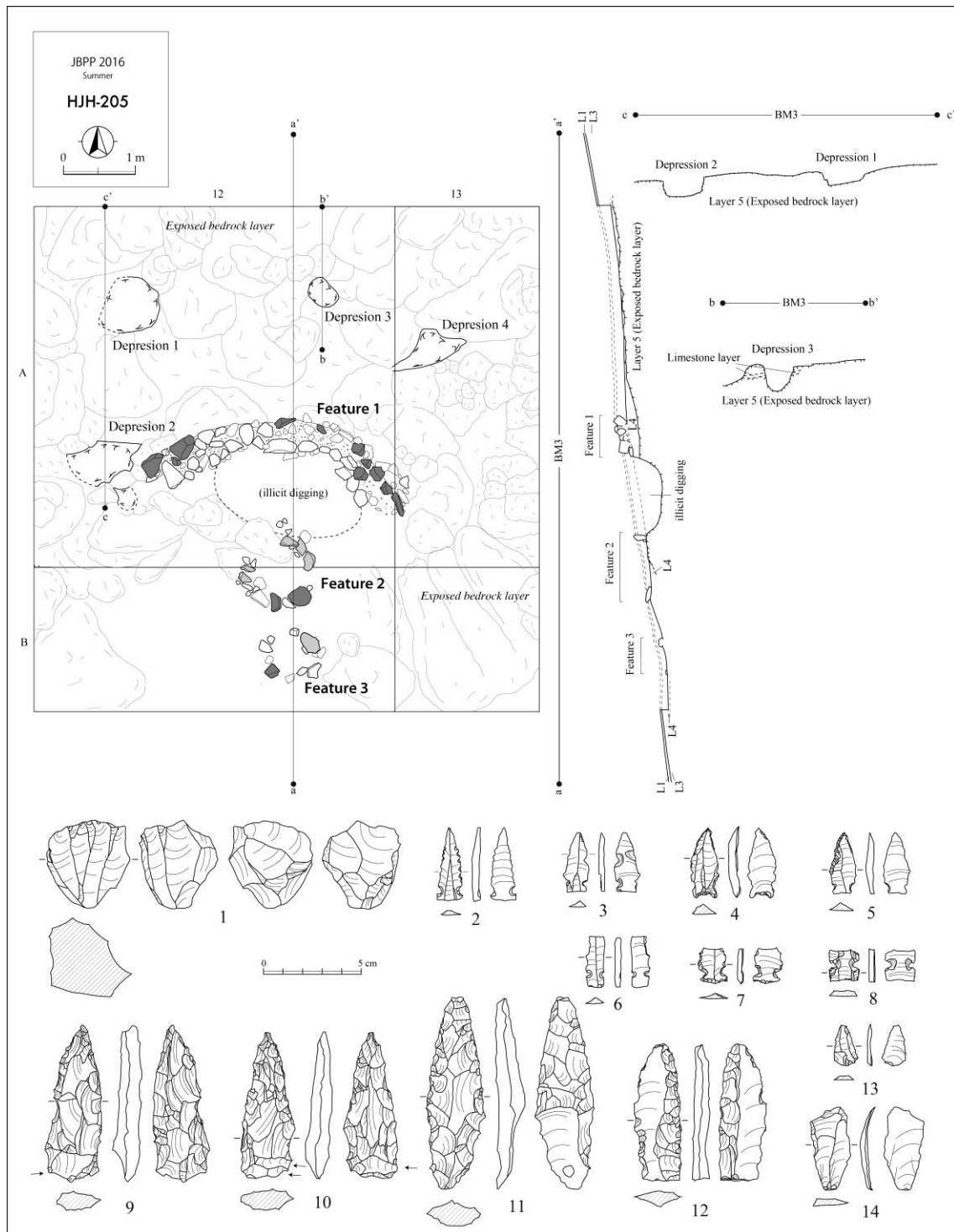


Fig. 3 Harrat Juhayra 205: structural remains and chipped stone artifacts.

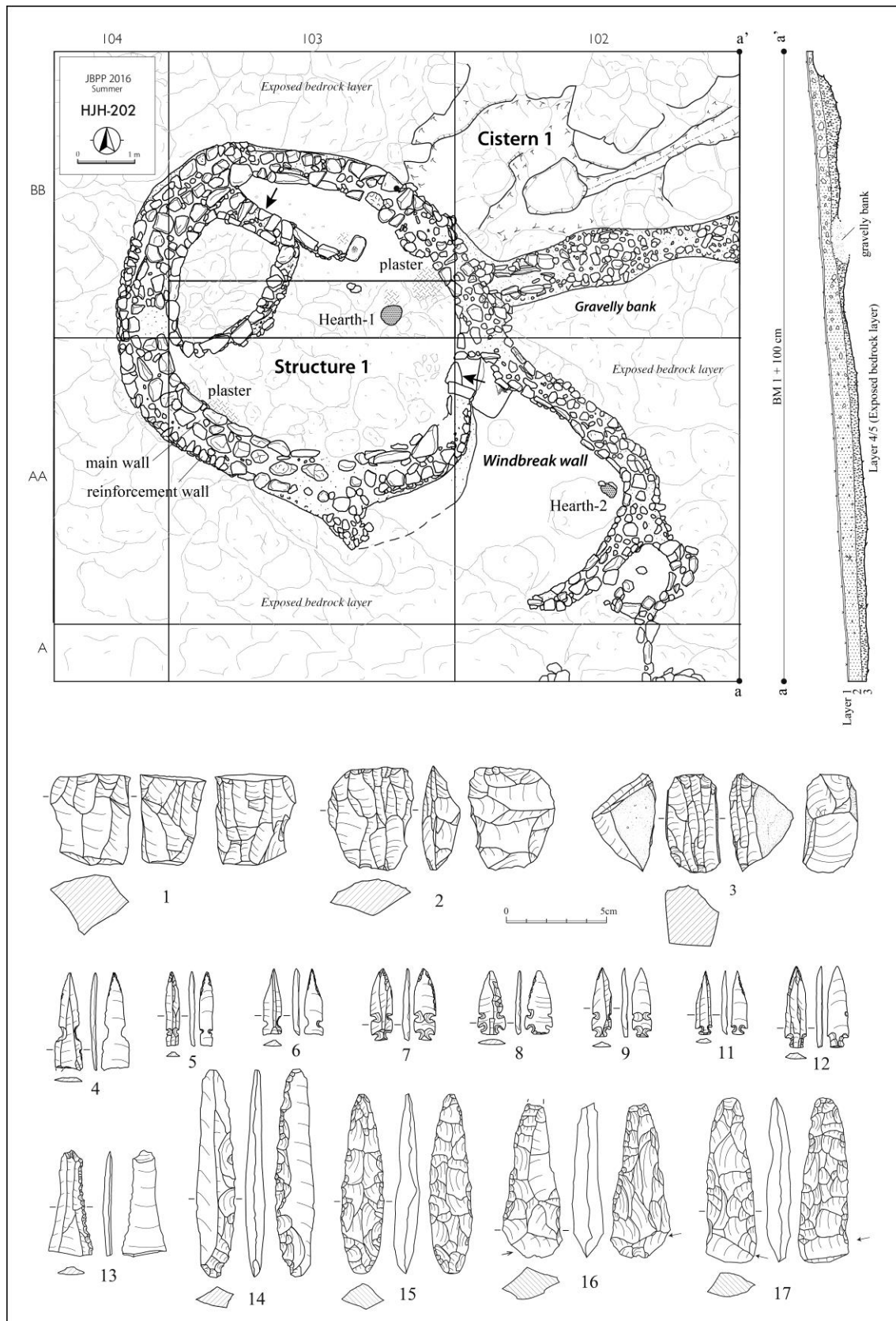


Fig. 4 Harrat Juhayra 202: Complex I and chipped flint artifacts.

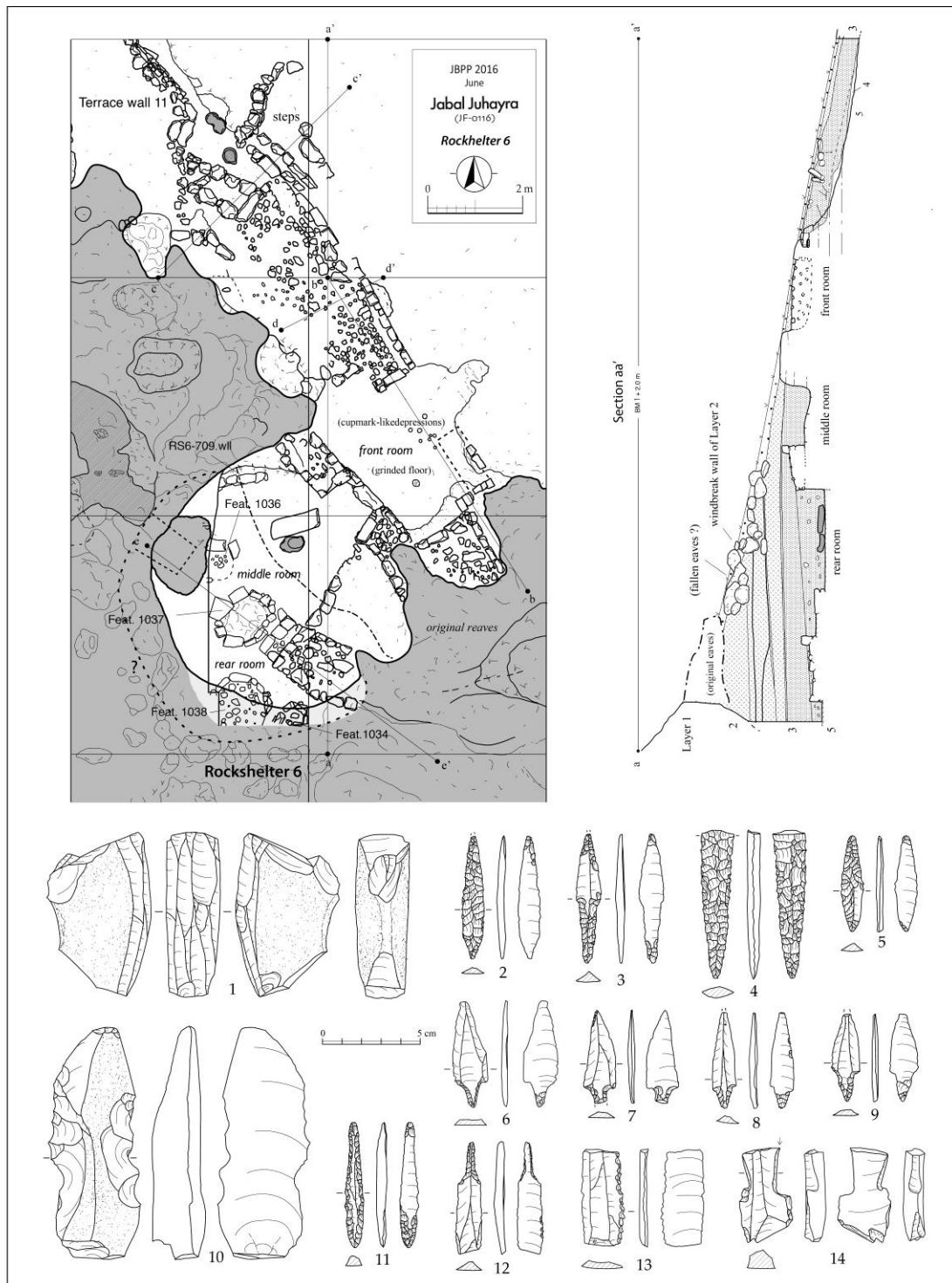


Fig. 5 *Jabal Juhayra: Rockshelter 6 and chipped flint artifacts.*

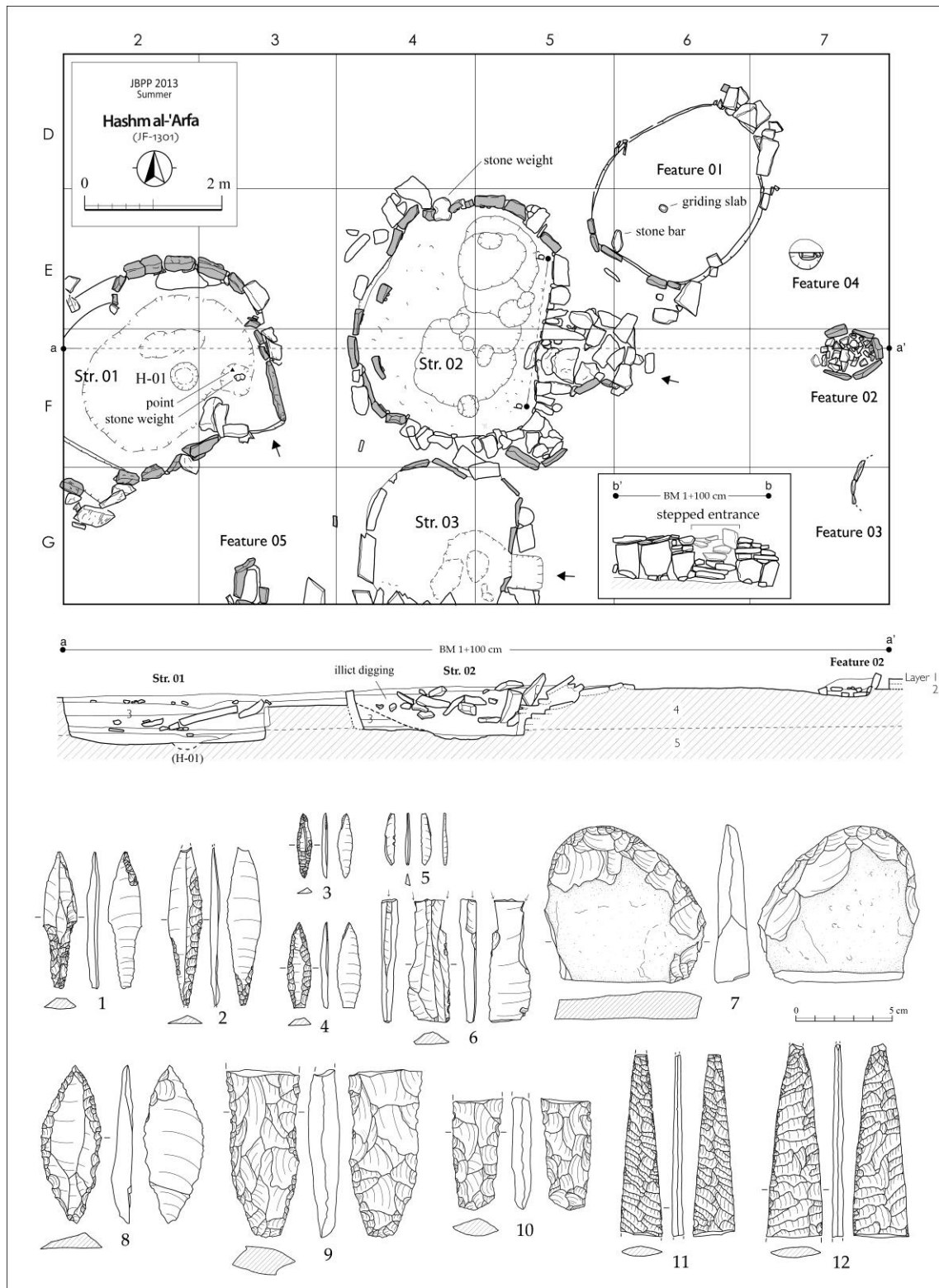


Fig. 6 Hashm 'Arfa: structural remains and chipped flint artifacts.

OxCal v4.3.2 Bronk Ramsey (2017); r5 IntCal13 atmospheric curve (Reimer et al 2013)

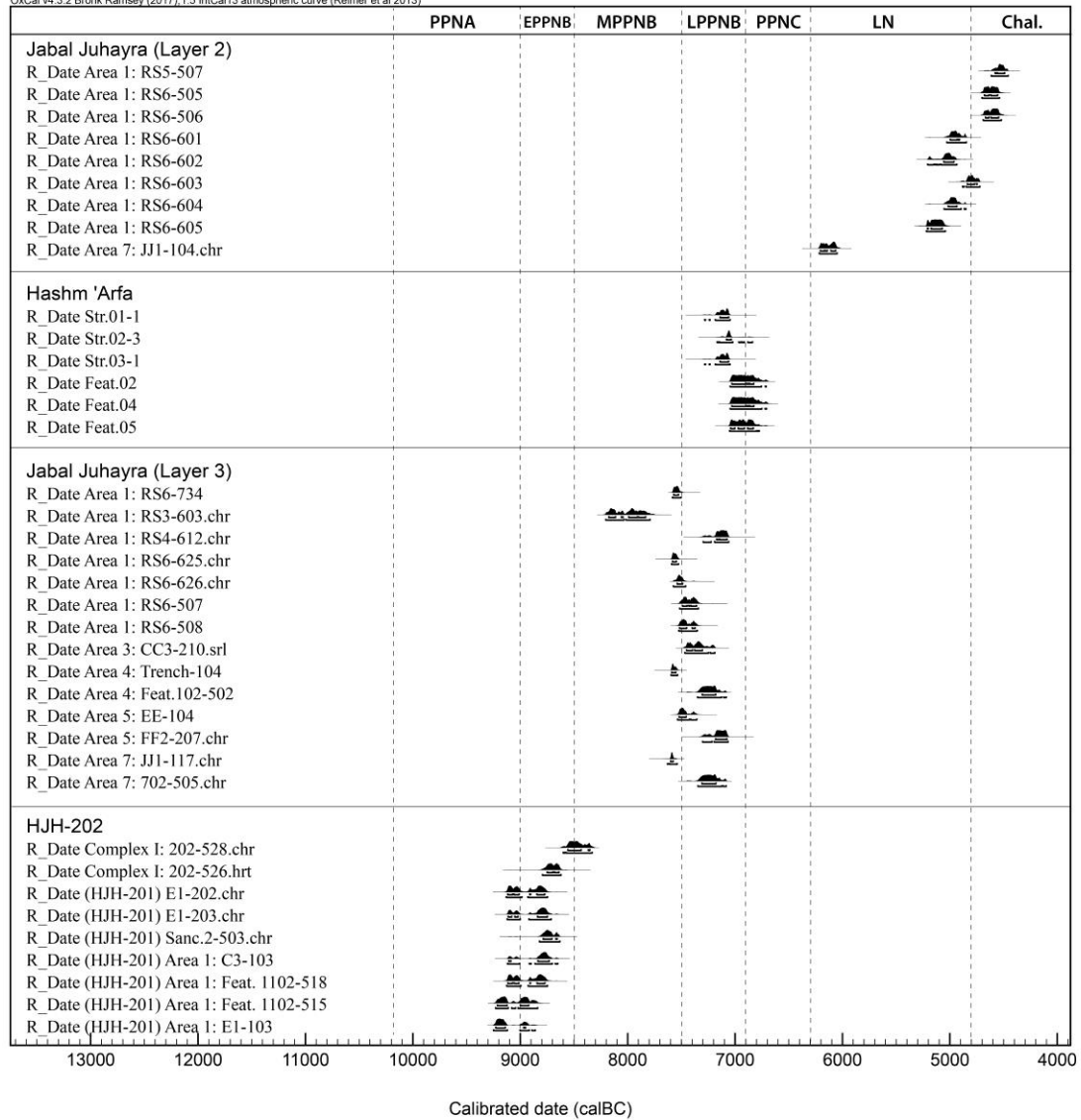


Fig. 7 C-14 data from the four Neolithic sites.

| | Outpost/Encampment | Barrage/Cistern | Open Sanctuary |
|---------------|--|--|--|
| Late Natufian | Wadi Qusayr 139 | | |
| PPNA | Harrat Juhayra 205 | | |
| EPPNB | Harrat Juhayra 202 | | |
| MPPNB | WAT: Complex 00-III? Wadi Ghuwayr 17 | WAT: Barrages 1-3/ Str. M Wadi Ghuwayr 17: St. 101 Wadi Ghuwayr 106 Wadi Nadiya 1: Barrages 1-2 | |
| LPPNB | Jabal Juhayra: Layer 3 WAT: Complex IV?-IX | J. Juhayra: Barrage & cisterns WAT: Barrages 1-3 Wadi Nadiya 2: Barrages 1-3 | J. Juhayra: slab-lined features |
| (PPNC) | Hashm 'Arfa | Eastern Jafr cistern-type barrages WAT: disused cistern | 'Awja 1-4 Harrat al-Juhayra QATW: NE Complex |
| LN | Jabal Juhayra: Layer 2 | | Jabal Juhayra: Layer 2 |

WAT: Wadi Abu Tulayha; QATW: Qa' Abu Tulayha West

----- : Jafr PPNB outpost complex.

Table 1 Renewal of the first half of the Jafr chronology (as of July 2017).

NEW NUMISMATIC EVIDENCES FROM THE AD-DEIR MONUMENT AND PLATEAU PROJECT (AMPP): THE FIRST 69 COINS FROM SEASON 2014

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Abstract

Since 2014, the Ad-Deir Monument and Plateau Project (AMPP) has recovered over 600 ancient coins from erosion clearance efforts at the Great Circle, the Temenos Slot Entrance to the Ad-Deir Monument, and Eastern Cliff Cistern B on the Ad-Deir Plateau. The vast majority of these coins have been recovered from the Temenos Slot Entrance that, upon erosion clearances, revealed a previously unknown bedrock staircase entrance to the northwestern side of the Ad-Deir Monument courtyard. This paper discusses the first 69 coins recovered during the 2014 excavation and research season, and proposes reasons why the vast majority of these coins represent the range of historic mints of the Nabataean king, Aretas IV. While it is not unusual for 50% of all coins retrieved from Nabataean archaeological contexts to come from the reign of this monarch, the presence of over 86% of these coins appearing in the very small area of the Ad-Deir staircase entrance lends further evidence for the probable uses of the Ad-Deir Plateau as a strategic Nabataean summer palace, as well as an easily protected mint storage facility during Aretas IV's wars with Judea and the growing threat of Roman power in the Near East.

Introduction: The Archaeological Contexts

In 2012, Dr. Cynthia Finlayson of Brigham Young University was asked by the Conservation Engineer of the Petra Archaeological Park to do an initial study of the condition of the Ad-Deir Monument with relation to the seasonal destruction caused by water erosion on the largest rock-cut façade in all of Petra. During

2013, Dr. Finlayson's archaeological team launched the first ever UAV/drone and GPS linked photogrammetric flight over the Ad-Deir Plateau that allowed for the capture of detailed topographic and archaeological imagery at a very low altitude (300m. in height)(See Figure 1).

The very high resolution of the resultant topographic and archaeological visual details obtained from this procedure had not previously been possible via the use of either satellite imagery or air plane photogrammetry, thus much new information was revealed about the concentration of archaeological elements on the Plateau as well as their situation within the existing landscape with relation to the Ad-Deir Monument. Following this GPS linked



Figure 1: UAV/drone aerial image of the Ad-Deir Monument, its courtyard, and the Temenos Slot Entrance to the courtyard on the NW (the slightly V-shaped entrance in the lower center of this image). Quarry marks on the top of the two wings of the Ad-Deir Monument can be seen with clarity given the ability of the drone to fly at 300m height. (AMPP 2013).

flight and the creation of a photo generated topographic map, the Ad-Deir Plateau was divided with GPS into 50m X 50m squares that were then examined via an ongoing pedestrian survey that allows for the recording of all

archaeological data (including all sizes and types of visible archaeological elements), as well as the input of each archaeological element into the MEGA form system that details not only the GPS coordinates of each observed item but also notes its possible cultural affiliation, date, and current conservation status and needs (See Figure 2).

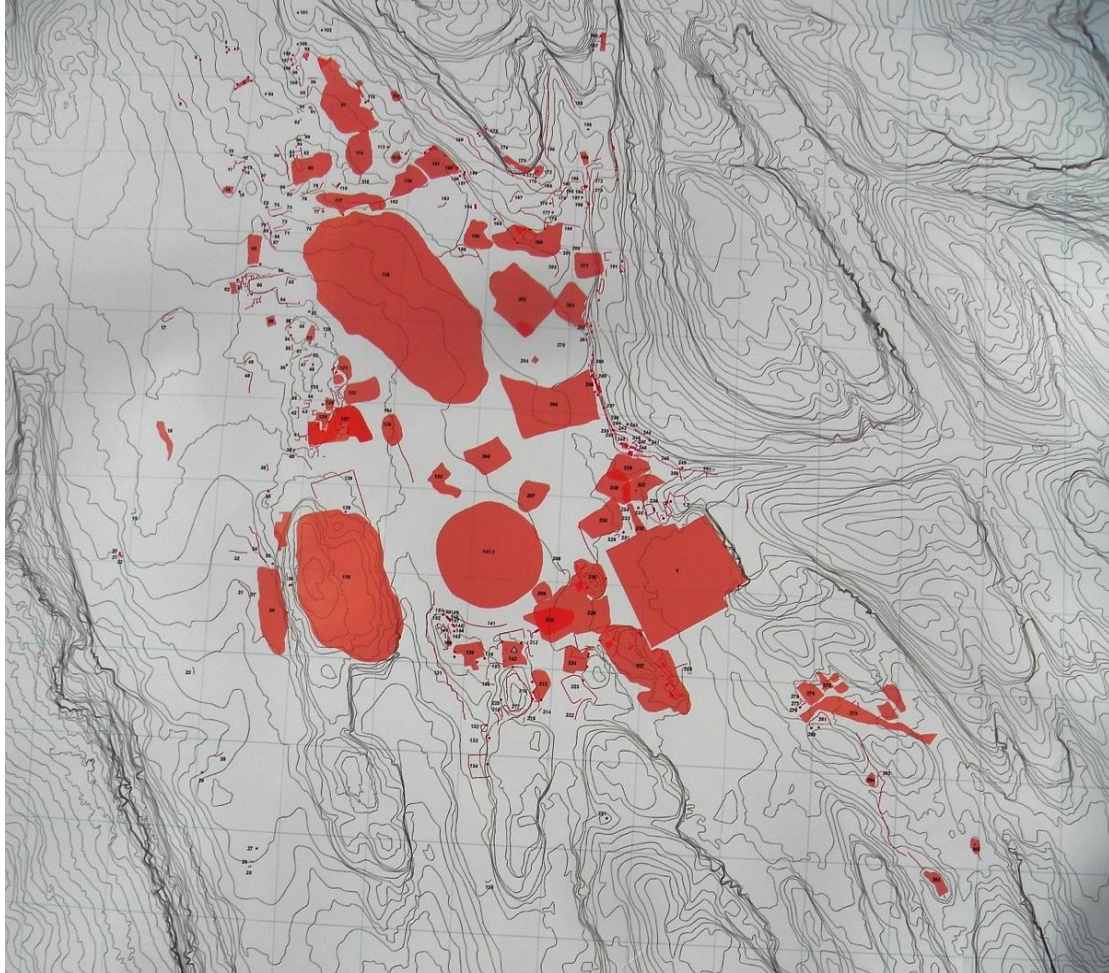


Figure 2: *An example of the concentration of archaeological elements on the Ad-Deir Plateau in closest proximity to the Ad-Deir Monument and their topographic position with relation to water erosion containment in the region. Each of these archaeological elements is numbered and entered on the MEGA form system that records its GPS location, critical descriptive information, cultural contexts, and conservation status and needs. (AMPP-2013).*

This intensive archaeological recording process will be completed for the entire Ad-Deir Plateau by the end of 2017. To date, this first ever mapping initiative has recorded over 400 archaeological elements on the Ad-Deir Plateau ranging in dates from a Late Neolithic to Early Bronze Age dolmen situated on top of the

Eastern Cliffs above the Ad-Deir Monument, to architectural and ritual elements dated to the Classical, Late Classical, and Islamic Eras.

Following the initial UAV flight in 2013 and accompanying field survey of the most concentrated archaeological regions surrounding the Ad-Deir Monument, AMPP presented the Jordanian Department of Antiquities and PAP with a Strategic Plan that listed all archaeological sites captured visually and mapped in 2013, and ranked each according to its importance with relation to: 1) its potential function as a protective structure related to the Ad-Deir Monument and ancient erosion controls on the Ad-Deir Plateau; and, 2) its unique archaeological importance and conservation status. Given the topographic study of the Plateau, the ongoing GPS/MEGA pedestrian survey, and the above Strategic Plan, three primary Nabataen edifices originally built by the ancient Nabataeans to protect the Ad-Deir Monument were targeted for initial erosion clearances, study, and restoration in order to halt the ongoing seasonal water events currently destroying the façade of the Ad-Deir Monument. These three edifices were: 1) the Great Circle, a 60m diameter pool slightly to the SW and on a slope above the Ad-Deir Monument that captures all water erosion potentially impacting the Ad-Deir Monument from the Berg-Berg Monument area and running down the western slopes of the Plateau into the Ad-Deir Courtyard; 2) the northwest Temenos Slot Entrance into the courtyard of the Ad-Deir Monument to which all natural water erosion on the entire south side of the Ad-Deir Plateau flows; and, 3) The Eastern Cliff Cisterns that were built by the ancient Nabataeans to capture and control all water erosion coming off the massif just to the north and slightly to the west of the Ad-Deir Monument for storage in gigantic rock-cut containment structures (See again Figure 2). The huge southwestern face of this mountain is subject to the annual storm fronts that originate in the Gulf of Aqaba and move up the Wadi Arabah to deluge Petra during the Winter and Early Spring months, often causing destructive flash flooding. The ancient Nabataeans realized the potential of utilizing this natural phenomenon as a sustainable water resource by engineering rock-cut channeling systems that fed all rain and snow melt from the Eastern Cliffs into seven, massive rock-cut cisterns at the base of this massif. The current erosion clearances of Cistern B have revealed the

capacity of just this one cistern to hold over 430 square meters of water (See Figure 3 below).

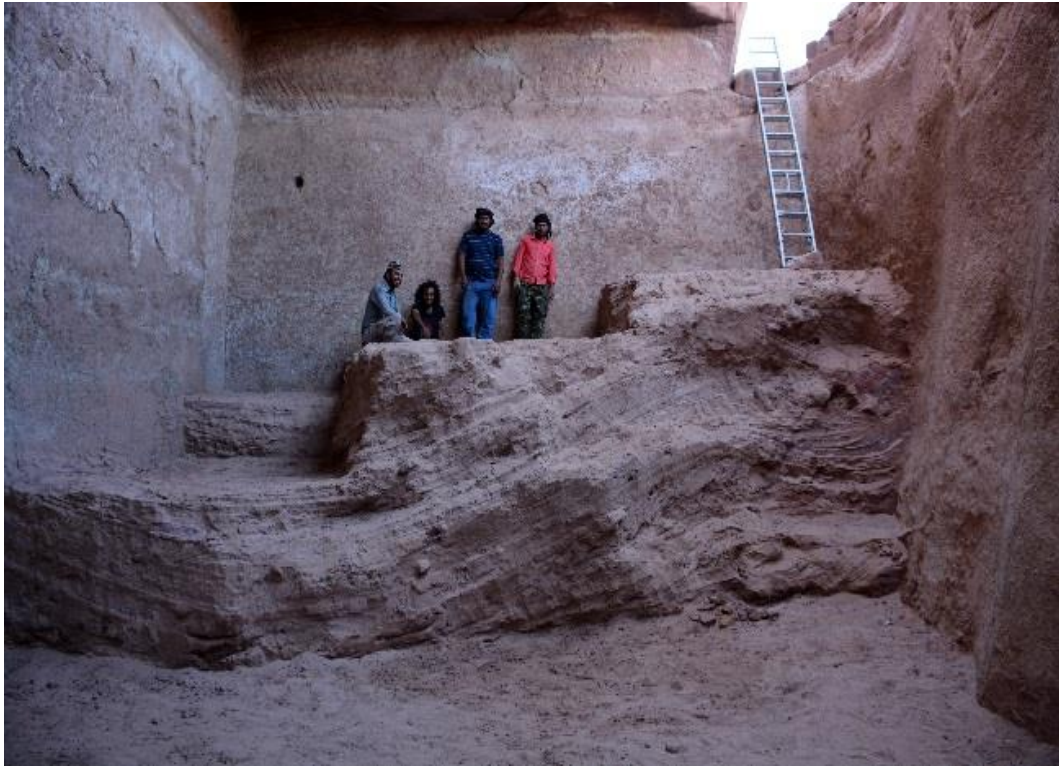


Figure 3: Erosion deposits still needing removal in Cistern B after the 2017 excavation and restoration season. Cistern B is one of seven massive cliff cisterns built by the Nabataeans to control and contain seasonal rain and snow melt coming off the Ad-Deir Massive just to the northwest of the Ad-Deir Monument. This one cistern is estimated to be able to contain over 430 cubic meters of water. (AMPP-Allardice-2017).

Clearances of the three ancient edifices noted above began with test excavations in 2014 that confirmed the importance of these structures as protective support systems for the Ad-Deir Monument. Full scientific archaeological excavations and clearances began in 2015 and have continued into the 2016 and 2017 seasons resulting in the recovery of massive amounts of pottery, other artifacts including jewelry fragments, lamps, and molded terracotta figurine fragments, but also over 600 ancient coins. The majority of these coins were retrieved from the Temenos Slot Entrance that upon erosion clearances revealed a beautifully carved bedrock staircase that served as an ancient access into the western side of the Ad-Deir Courtyard via an arched portal (See Figure 4). This paper discusses the first 69 coins recovered from this region during the 2014 excavation season, most of which were retrieved from the base of the stairs

leading into the Ad-Deir *temenos*, having been washed against the wall structure that supported an arched entrance into the Ad-Deir Courtyard itself (See Figure 5).



Figure 4: The previously unknown bedrock staircase leading into the Ad-Deir Monument Courtyard from the northwest. The majority of the coins retrieved came from the bottom stairwell platform to the lower right on this photo. (AMMP 2016).



Figure 5: The south end of the Temenos Slot Entrance into the Ad-Deir Monument Court Yard after 2,000 years of erosion cleared from the site, with the profile face of the emerging courtyard floor and the extant supports on either side of the lower entrance visible in this

photo. Most of the coins recovered in 2014 came from the region next to this lower entrance at the base of the bedrock staircase. (AMPP-Harris-2016).

Given its role as the erosion catch field for the entire southern side of the Ad-Deir Plateau, all soils from the Temenos Slot Entrance region were screened through fine mesh, thus all potential coins and small jewelry remnants were carefully retrieved and documented given their stratigraphic level and archaeological grid square location. Further laboratory processing in the field began with a gentle field cleaning of each coin, initial photo documentation, and an initial attempted identification of each coin as well as each coin's entry into a computer photo-enhanced data base log and paper-based catalogue. With permission of the Jordanian Department of Antiquities and the Petra Archaeological Park, the coins from the 2014 through the 2016 excavation seasons were transferred to ACOR in Amman for a more professional cleaning in 2016. In 2016 and 2017 all cleaned coins were re-photographed with a Dynolite/Computer Magnification system that allowed for an enlarged image of each coin to be added to each of their data logged files. At this time the coins were again visually examined and corrections and additions made to the initial visual database and paper records. A third visual examination in raking light was completed for the 2014 coins in October of 2017 and provided the final corrected data study for the report noted below. Significantly, this process revealed that three visual examinations (one before professional cleaning, one as part of the Dynolite process after professional cleaning, and a final visual examination with raking light) provided the most information with the final visual examination often correcting previous coin identifications and/or providing further iconographic information that had been missed either in the initial field examination or even by the magnification of the coins via Dynolite Photography post their cleaning at ACOR.

It is important to understand that the very survival of these coins, given their location in an erosion context that was churned yearly by seasonal flooding, is in itself an amazing archaeological event. Additionally, it is also significant that a great number of these coins can still be identified by their surviving mint iconography given the natural corrosive conditions that they were exposed to over the past 2,000 years of seasonal flooding and stratigraphic churning in the Temenos Slot Entrance. These coins also beg the question of whether or not the

unique metallic content of the bronze coins of Aretas IV inadvertently allowed more of this monarch's bronze mints to survive than those of other monarchs, or, if the quantity of coins produced under Aretas IV is the only reason for their large numbers to appear in archaeological contexts at Petra? As one of the largest caches of coins retrieved from scientific archaeological contexts from within Petra itself, these coins are indeed an important and amazing contribution to Nabataean scholarship and assist us in better understanding the functions of the Ad-Deir Plateau over time.

Nabataean Coins and a Brief Review of Previous Scholarship

While many scholars have addressed the subject of Nabataean coinage (see the Bibliography for this article), the individuals and publications noted below have contributed ongoing critical works pertinent to an in-depth study of the coins retrieved from the Ad-Deir Monument and Plateau Project and are thus worthy of special mention.

In 1975, the Israeli scholar and numismatist Ya'akov Meshorer published an updated study and catalogue of 205 Nabataean coin types that is still utilized extensively today within Nabataean studies (Meshorer 1975). In this modern foundation text, Meshorer provided a comprehensive chronology of all previous scholarly works on Nababataean coins beginning with François Lenormant in 1857 to the 1970's, as well as providing a scholastic review of what was known by 1975 about Nabataean mints within the historic, epigraphic, and archaeological contexts of the ancient Near East (Meshoror 1975: 1-8). Meshorer's study and catalogue then went on to discuss chronologically the mints of the Nabataean kings utilizing numerous coins from the collections of the British Museum and others as visual examples, however, there were numerous flaws in Meshorer's iconographic study of the decorative motifs utilized on coins by the ancient Nabataeans. In addition, given the number of new archaeological finds that occurred over the subsequent twenty years, Meshorer's catalogue of Nabataean coin types was updated and expanded in a three-part series of journal articles published by Karl Schmitt-Korte and Michael Cowell in 1989 (Schmitt-Korte and Cowell 1989: 33-58 & Plates 11-17); Karl Schmitt-Korte in 1990 (Karl Schmitt-Korte 1990: 105-133 & Plates 10-16); and Karl Schmitt-Korte and

Martin Price in 1994 (Karl Schmitt-Korte and Martin Price 1994: 67-131 & Plates 10-12). Additionally, these authors applied new scientific methods to coin analysis including X-Ray Fluorescence Analysis (Schmitt-Korte and Cowell 1989: 33-58), thus beginning a more concise analysis of the metallic content and characteristics of Nabataean mints for each monarch. Schmitt-Korte (1990: 125-131) also highlighted a number of 'anonymous' Nabataean coins, some of which had been previously discussed by E.S.G. Robinson in 1936, as well as new finds, and re-opened the scholarly discussion surrounding the possible identification of these 'anonymous' coin examples with specific Nabataean kings (See also Robinson 1936: 288-291 & Schmitt-Korte 1990: 150).

While Schmitt-Korte (1990: 126-127) added 88 new Nabataean coins types to Meshorer's previous catalogue, including a number of silver coins attributed to Obodas III, this new and updated compendium of all known Nabataean mints by the 1990's did not answer the ongoing question within Nabataean studies of whether or not Obodas II and Obodas III were really two separate Nabataean kings (Schmitt-Korte 1990: 126-127). That question is still the subject of debate and continuous study as new coins emerge from archaeological field contexts and other sources such as private and/or museum collections and coins seized by government officials from Black Market contexts.

In 2006, Rachel Barkay of Hebrew University in Jerusalem continued the legacy of Meshorer and began publications that attempted to fill in scholarly material with relation to the mints of the enigmatic early kings of Nabataea (Barkay 2006: 99-103). In 2006, Barkay addressed four new silver coins acquired by the Bank of Israel from the mints of Malichus I (c. 60-c. 30 B.C.E.) and Obodas III (c. 30-c. 9 B.C.E.) (Barkay 2006: 99-103). In 2011, Barkay published new perspectives concerning the 'anonymous' coins from Nabataean mints based on a re-examination of three inscriptional sources including an Egyptian papyrus now in Milan that consisted of epigrams composed by the poet Posidippus of Pella during the reign of Ptolemy II (286-246 BCE); a basalt Nabataean inscription of the third century B.C.E. in the National Museum of Damascus; as well as a re-evaluation of the works of Strabo that were gleaned by this ancient author from earlier third century B.C.E. sources (Barkay 2011: 67-73, Pl. 4-5). Strabo's account of the Nabataeans also complimented the later works of Diodorus

Siculus (Barkay 2011: 70). Barkey then provided a suggested new typology classification of four distinct groups for the ‘anonymous’ Nabataean coins and suggested the association of the first and earliest grouping of coins with an early king of the Nabataeans named ‘Malichus,’ the second group of ‘anonymous’ coins with Aretas I, and the third and/or fourth grouping of coins associated with Aretas II (possibly Erotimus?) (Barkay 2011: 70-73, Plates 4-5). Barkay’s new coin typology is currently debated among scholars in Nabataean/Petra studies. In 2016, Barkey continued publications on the coinage of Obodas II (c. 30-c.9 B.C.E.)(Barkay 2016: 83-110, Plates 15-17). All of the above publications are critical foundation research texts with relation to the over 600 bronze coins retrieved by the Ad-Deir Monument and Plateau Project, however many more scholarly sources regarding the study of Nabataean coins are included in this article’s Bibliography.

Nabataean Kings and Coins and the Ad-Deir Examples from 2014

In order to appreciate fully the bronze mints retrieved from the Ad-Deir Plateau Project it is useful to briefly review the known mints and dates of the Nabataean kings as well as each of their basic iconographic characteristics. As noted above, scholars still debate the existence and identity of the earliest Nabataean kings of the third century B.C.E. who may have minted some of the ‘anonymous’ coins associated with Nabataean cultural contexts. Additionally, by c. 168 B.C.E. potential coins minted by Aretas I are also debated as are the possible mints and even the existence of Rabbel I (c. late second century B.C.E.). While the dates and identities of Aretas II (c. 103-96 B.C.E.) and Obodas I (c. 96-86 B.C.E.) are more historically firm, their associated coinage is still a subject of conjecture by modern scholars. However, almost all scholars agree that the first Nabataean king to be identified with a specific series of coinage was Aretas III, Philhellene (r. 87/86 to 62 B.C.E.) beginning with his mints produced in Damascus from 84-72 B.C.E., however both Meshorer and Schmitt-Korte present differing views concerning the association of some of these coins with Aretas II and/or Aretas III (For example, Meshorer 1975: Pl. 1, 1-Sup1 and Schmitt-Korte 1990: 125-126). For the purposes of our discussion, this paper will begin with the iconography of the silver coinage of Aretas III, Philhellene and then briefly describe each of the

subsequent Nabataean kings and both their silver and bronze coinage styles as a comparative tool to help identify, quantify, and to put into historical contexts, the coins recovered from the Ad-Deir Temenos Slot Entrance in 2014.

Coinage Minted by Aretas III, “Philhellenos” (r. 87/86-62 B.C.E.; mints 84-72 B.C.E.)

As previously discussed, it should be noted that some scholars, including Meshorer and Schmitt-Korte, were uncertain as to whether a number of the coins minted during this early era should be attributed to Aretas II rather than Aretas III (Meshorer 1975: Pl. 1-Sup 1, and Schmitt-Korte 1990: 125-126). Given their very heavy Hellenistic stylistic characteristics, I agree with other scholars that the strongest argument for their royal mint association is with Aretas III during his rule over Damascus. Additionally, I agree that these beautifully rendered silver coins were probably minted before the capture of Damascus by Tigranes, the King of Armenia, in 72 B.C.E. Thus, the design and execution of these coins took advantage of the famous metallurgy craftsmen available in that ancient trade city. Most notably, the Nabataean silver coins of this era are of extremely high design quality, with Greek inscriptions, and host a 95% silver content that does not mesh with the Attic standard, but rather the Phoenician mints of Tyre whose metal standards were also adopted by both the Ptolemies and the Seleucids in Egypt, the Levant, and Asia Minor (Schmitt-Korte & Price 1994: 93-94). Early Nabataean bronze coins are also similar to the Phoenician metallic standard. These facts point to the residual power and influence of the Phoenician city-states of the Levantine coast as centers of trade and commerce well into the Persian and Hellenistic eras even after their conquest by Alexander the Great and his successors. Significantly, the portraits of the Nabataean monarch often depicted on the obverse of this early mint series are extremely detailed and beautifully rendered (as are the depictions of an Athena-like figure also on the obverse and a Nike or Tyche-like figure on their reverse). Schmitt-Korte and Price have noted the similarity of these coins to various Seleucid dynastic mints especially those of Demetrius III, Antiochus VIII Grypus and Antiochus XII (Schmitt-Korte & Price 1994: 93-94). However, the Athena and Nike/Tyche coinage was also obviously influenced by the famous gold stater of

Alexander the Great in design inspiration, as were many coin designs throughout the Eastern Mediterranean region following Alexander's death. These Nabataean mints from Damascus are thus quite easily identified by their beautiful obverse portrait types, the use of an Athena inspired figure and winged Nike or Tyche figures on the reverse, as well as Greek, not Nabataean inscriptions, as well as their high metallic content that is compatible with the Phoenician standard. However, it must be noted that the images of Athena and Nike/Tyche may not have been associated with these Greek mythological characters by the Nabataeans, but rather borrowed to depict Nabataean deities with similar personality characteristics. For example, at Palmyra, Syria, this sister Arab/Aramaean civilization utilized the sculpted imagery of Athena to represent Allat, the Arab goddess of desert warfare and fate (Blétry 2001: 67-71 & Fig. 69). We should therefore not unquestionably assume that the female deity on these early Nabataean mints hosting the attributes of a Greek Athena actually depicted Athena in the minds of the Nabataean public, or even the Hellenized society of Damascus with its strong latent Semitic Aramaean roots.

It must also be remembered that Damascus was one of the major commercial and caravan trading cities of both the Persian Empire and the later Seleucid Dynasty, with a long history of metallurgic as well as jewelry design industries. Thus, by the Roman Period, Damascus hosted a very famous metals/armory foundry and eventually became the home of the development of the famous 'Damascus steel' industry during the Islamic eras. With the Nabataean loss of Damascus and its metal craft industries to the Armenian king, Tigranes, and the subsequent campaigns of Roman forces in the East including Pompey's march down the Levantine Coast in 64 /63 B.C.E., Nabataean mints probably relocated to Petra by the end of 72 B.C.E. if not before. However, no forges or mint facilities have yet been discovered at Petra via archaeological excavations.

Significantly, none of the early mints of Aretas III were recovered from the Ad-Deir Temenos Slot in 2014, possibly indicating that the Ad-Deir Plateau was not yet a site for intensive settlement and/or strategic development at this time in Nabataean history. However, it must be remembered that the coins minted by Aretas III at Damascus were not seemingly in common usage in southern Jordan, but intended for the commercial enterprises focused at Damascus. The lack of

coins on the Ad-Deir Plateau minted by Aretas III may thus just reflect a phenomenon shared throughout the region of Petra as a whole.

Coinage Minted by Obodas II (r. 62-60/59 B.C.E.).

The mints of Obodas II continue the usage of a royal portrait facing right on the obverse of coins, but are the first extant examples of the Nabataean use of the eagle on the reverse. These coins also host a distinctly wider rim border edge especially on the obverse side as well as an extremely complex multi-leveled royal diademed headdress for the king who also often hosts long bangs of hair on his forehead as well as long snail curled hair to the upper shoulders. It should be noted that this sophisticated coiffured Hellenistic hairstyle contrasts dramatically with the later wild and loose hairstyle of some of the coins of Aretas IV to be discussed below. One possible coin minted by Obodas II was retrieved from the Ad-Deir Temenos Slot in 2014, however, the coin is greatly worn and its identification with Obodas II problematic. A photo has not been included herein due to its poor condition. The coin does host the wider rim edge characteristic of the coins of Obodas II as well as a faint royal male portrait facing right with a complex headdress and forehead bangs. The reverse of the coin also hosts a wide rim edge, but its central decorative motifs are worn away with no identifiable indications of an eagle motif. This coin thus remains only tentatively identified with Obodas II but may indicate that the Ad-Deir Plateau was beginning to be utilized more intensely by the population growth within Petra itself. Continued analysis of the coins retrieved during the 2016 through 2017 excavations seasons on the Ad-Deir Plateau may add further information regarding this single coin and its tentative association with Obodas II.

Coinage Minted by Malichus I (r. 60/59-30 B.C.E.)

The coins of Malichus I continue both the use of an obverse royal portrait and at times the depiction of an eagle on the reverse, but also introduce the first extant use of a Hellenized single cornucopia on the reverse of selected Nabataean coins. The hair of the monarch is again often heavily coiffured with long snail curls descending to his shoulders. These coins also introduce, for the first time, the Nabataean use of a raised hand of blessing that appears on the reverse of some

coins—an iconographic motif that seemingly was not preserved in the mints of subsequent Nabataean kings. The raised hand in Semitic Near Eastern contexts was widespread and often associated with contexts of priestly blessing both in pagan cults as well as within Judaism where it was also enhanced by specific finger positions. The use of the ‘heh’ and/or ‘heth’ letters (the Nabataean alphabetic symbols for two types of ‘h’ sounds in Nabataean Aramaic) also appears for the first time on the coins of Malichus I as well as his successor Obodas III, but these symbols later attain emblematic use and association with Aretas IV. Other common symbols utilized within the coinage of Malichus I include the ‘O’ and ‘X’ although these motifs also continue in usage by Obodas III and Aretas IV. It has been suggested that the ‘h’ symbols combined with ‘O’ on these coins identified them as ‘Nabataean money,’ while ‘X’ usually indicated 4 of a regnal year, however, these attributions are still debated.

No coins of the mints of Malichus I were recovered in 2014 from the Ad-Deir Project. Thus, depending on the information forthcoming from the assessment of coins for the 2015-2017 excavation seasons, this lack of coins from the reign of Malichus I may indicate that the previous association of a single coin with Obodas II as noted above may be incorrect and require further re-evaluation.

Coinage Minted by Obodas III (r. 30-9 B.C.E.) (The only deified Nabataean king)

The coins of Obodas III begin a slight reduction and devaluation in the silver content for silver coins from 95% to 90% (Schmitt-Korte & Price 1994: 81). In addition, the mints produced during the reign of Obodas III initiate a number of critical changes within Nabataean numismatic iconography. Obodas III is credited with the first use of jugate portraits (two portraits depicted side-by-side usually those of the king and his mother, sister, or wife). This was a common iconographic aspect of both Ptolemaic and Seleucid coinage that celebrated the powerful roles of Hellenistic queens in the East as well as the differing female gendered roles in the East, Egypt, and Asia Minor versus women’s accepted political roles in Latin Rome during the same time periods. These coins also host the first extant use by the Nabataeans of both the thunderbolt and the camel (possibly representing the Nabataean deity Dushares, or a male desert deity similar to the Palmyrene caravan deity Arsu) as an iconographic motif.

Significantly, no subsequent Nabataean coins have been found that host a camel, and it is thus the only mammal ever depicted on Nabataean types through all mint groupings, just as the eagle is the only bird ever utilized within Nabataean coin iconography. The portrait of the king continues the Nabataean tradition of long, highly coiffured snail-curl hair for royal males with the hair tied by a fillet—a common hair style for Hellenistic rulers in the Near East and Asia Minor.

The coins of Obodas III also introduce, for the first time in Nabataean contexts, the depiction of a priestess-like female (probably the queen) on the reverse of selected coins with her right arm raised in blessing stance. These coins are thus the first Nabataean coins to celebrate the position of mortal females within Nabataean society and cult ritual rather than only hosting the images of immortal female deities. Such mints are critically significant indicators of the importance of women in Nabataean society as well as the potential ritual and political functions of Nabataean queens within Nabataea. (See also Barkay 2016: 13-21).

Three possible bronze coins from the reign of Obodas III were recovered during the 2014 AMPP work season, however, due to the fact that both Syllaeus and Aretas IV retained a number of the Nabataean coin styles of Obodas III, these three coins from the Ad-Deir Plateau may also be representative of the short rise of Syllaeus within the Nabataean Court as well as the early mints of his successor Aenaeas/Aretas IV, or even Rabbel II. Their firm identification is hindered by their poor condition on either their obverse or reverse sides. Each of these examples was thus categorized as 'Indeterminate' and a photo not provided in this article (See Appendix I-Coin Analysis and Synopsis).

Coinage Minted by Syllaeus (r. 9 B.C.E.; death disputed between 9-6 B.C.E.)

The events surrounding the rise and demise of Syllaeus within Nabataean court contexts during the last three decades of the first century B.C.E. remain ongoing controversial topics within Petra Studies (Al-Rawabdeh 2015: 75-82; Accettola 2012: 18-20; Wenning 2007: 33-36; Anderson 2010: 392; Mayerson 1995: 17-24; and, Bowerstock 1983: 46-49). Strabo (a contemporary figure giving his accounts in *Geography*, 16-17) and Flavius Josephus (*Jewish Antiquities*, 16, first century C.E.) present us with different aspects and versions of Syllaeus'

personality and roles within the hotbed of Roman, Nabataean, and Herodian politics of the late first century B.C.E. Seemingly, Syllaeus was appointed a chief minister (*epitropos*) under the Nabataean king Obdodas III soon after Syllaeus' famed role in a failed Roman attempt to conquer and control the spice trade of southern Arabia and Yemen (Hill 1922: XVI). Syllaeus then appears in various locations as a foreign ambassador to the courts of Herod the Great in Judea as well as to Augustus in Rome. As Al-Rawabdeh notes, a bilingual Nabataean and Greek inscription published by Karwerau and Rehm in 1914, p. 387, records Syllaeus' official titles as "brother to the king' of Obodas III. Both Strabo and Josephus note that Syllaeus was able to accumulate significant political power in the Nabataean court due to either the frail condition of the elderly king, Obodas III, and/or the disinterest of Obodas III in international political affairs. However, Wenning (2007: 34-35) disagrees with this account citing the very active building program at Petra ascribed to Obodas III during his reign. Historic accounts of the events surrounding the death of Obodas III and Syllaeus' possible role in the demise of this Nabataean monarch are all suspect given the intense political intrigues of the day. At the death of Obodas III, Aenaeus, later known as Aretas IV, claimed the throne via his supposed genetic links to the earlier Nabataean king, Malichus I, but did so without the permission of Augustus. This event seemingly occurred during a period of time that Syllaeus was still in Rome and therefore closest in proximity to the ears of the Roman ruler of the Eastern Mediterranean. A battle of political intrigues ensued from 9 B.C.E. to 6 B.C.E. during which time Syllaeus may have briefly ruled either independently or jointly with the young Aretas IV. Eventually, in such a highly charged political atmosphere, there is usually a winner and a loser. By 6 B.C.E., Syllaeus was accused of so many intrigues and murders that he was tried both in Syria and Rome and finally executed leaving Aretas IV sole recognized client monarch of Nabataea recognized by the Roman Emperor Tiberias.

The above events explain the ongoing scholarly controversy over the Nabataean coins minted during this chaotic political era (Al-Rawabdeh 2015: 79-81). Early coins seemingly emphasize Syllaeus' dominant position within the Nabataean court immediately following the death of Obodas III, while slightly later coins indicate a short period of cooperation between Syllaeus and Aretas IV (Al-

Rawabdeh 2015: 80; Schwentzel 2005: 154-155; Kropp 2013: 477; Meshorer 1975: 36-40). Significantly, Syllaeus seemingly never imprints Nabataean coins with his own image as the earlier coins of this era only depict the portrait of Obodas III on the obverse, however, some coins often host the Nabataean letter “S”/letter ‘sheen’ on the reverse as the first letter of Syllaeus’ name and his monogram. Slightly later coins again retain the portrait of Obodas III, but on the reverse host both the monogram of Syllaeus (“S” or ‘Sheen’) and that of Aretas IV (“H” for either ‘Heh’ or ‘Heth’) within a surrounding wreath (imprints of either ‘H’ type are often difficult to differentiate in Nabataean mints). This may indicate that the solidity of the royal position of both men was so tenuous that they both had to engender the earlier symbolic and visual personage of the ‘divine’ Obodas III even after this older king’s demise. While not new, the double cornucopiae also became a common motif on Nabataean bronze coins as a symbol of fertility and abundance. The motif had previously been utilized on earlier Hellenistic coins of the Eastern Mediterranean Region and is commonly utilized in many art forms of the age.

Significantly, the Ad-Deir excavations of 2014 retrieved one probable coin of Syllaeus with the “S” or ‘Sheen’ letter on the reverse as well as the three coins noted above that may be associated with Syllaeus but are ‘Indeterminant,’ in other words, they share similar designs and iconography with the mints of Obodas III, Aretas IV, and Rabbel II but can’t be identified unquestionably with any of these individual monarchs. These four coins, however, initiate the increase in the use of the Ad-Deir Plateau during the tenuous political times of the late first century BCE through the first century CE.

Coinage Minted by Aretas IV, Philopatris (r. 9 BCE-40 CE)

In 9 B.C.E. the political position of Aretas IV was seemingly stabilized and he began minting his own coin series with his portrait image on the obverse. It is significant to note that Aretas IV ruled independently for forty-eight years becoming the longest ruling monarch in Nabataean history, and thus producing the largest numbers of coins recovered from Nabataean archaeological contexts due to both the length of his reign and the numbers of armed conflicts that this king was engaged in with Judea that required increased coinage production in

order to pay his military field expenses. Aretas IV is also noted for significantly reducing the silver content of his silver coins over the length of his reign, eventually reaching a roughly 50% silver content that was closer to a Roman standard than that of the previous Tyrian Phoenician standard initially used by earlier Nabataean monarchs and the Hellenistic kingdoms of Ptolemaic Egypt and Seleucid Syria (Schmitt-Korte & Cowell 1989: 57). This devaluation of Nabataean silver coins is a significant marker of the increased Roman military, economic, and political power in the region, as well as the potential decline in the access to silver sources outside their kingdom by the Nabataeans.

Fully 86% of the identifiable coins retrieved during 2014 by AMPP were bronze coins minted by Aretas IV during almost all stages of his reign except for the jugate mints of Aretas IV and his mother Huldu (issued from 9 BCE to CE 15). Of added significance is the fact that these coins were recovered from a relatively small area at the base of the newly discovered stairs leading into the courtyard of the Ad-Deir Monument, having been washed down the stairs from the northwest (See again Figure 5). As noted previously, it is not unusual to recover a high percentage of Aretas IV coins from any excavation in Petra, however, the usual percentage rate of recovery is 50% from an entire excavation site. In the case of the AMPP 2014 work, 86% of the coins recovered were minted by Aretas IV, and they were retrieved from a very small excavation area of only 5m X 5m. Additionally, this percentage may even be higher given the fact that many of the coins we have designated as 'Indeterminate' may in fact be Aretas IV mints (See Appendix A). It is thus important to note which mint dates and numbers of coin types appear indicating both the potential uses of the Ad-Deir Plateau at these dates as well as the reasons behind the distribution of coins of certain types and dates in such a concentrated deposit.

Early single portrait coin types of Aretas IV from the Ad-Deir 2014 excavation begin to appear dated from 9 BCE onward down to CE 18. Portrait types increase in numbers between 4-3 BCE, and then increase in numbers again in 39-40 CE (See Appendix I-Coin Analysis for 2014-Aretas IV). Of these early single portrait types, sixteen were recovered. Three additional portrait types were recovered that also hosted the so-called *caduceus* motif on the reverse, one coin with a laurate single portrait type on the obverse, as well as two coins with a

circular wreath motif on the reverse were also retrieved. All are easily identifiable given the monogram of Aretas IV. Interestingly, no early jugate portraits of Aretas IV and Queen Huldu appear in this collection--mints that often depict the king without a mustache potentially indicating his youth. Scholars debate whether or not Queen Huldu was the mother, or the first wife of Aretas IV. However, given the association of this queen with a young Aretas IV devoid of a mustache, we may tentatively assume that Huldu was his mother and a powerful woman who may have acted as regent during the early years of Aretas IV's ascendancy to the Nabataean kingship. Given the political turmoil indicated by the intrigues of Syllaeus noted above, this mother-queen may have played an important role in securing the throne for her son and assisting him in stabilizing the political situation both before and after the death of Augustus in 14 BCE. This situation may also help to explain the increased usage of a female priestess figure on the reverse of Aretas IV's coins as well as jugate portraits of the king with a female figure on the obverse of bronze coins minted by Aretas IV throughout his reign.

Coins retrieved from the 2014 Ad-Deir erosion clearances indicate that by the years 7 to 8/9 CE, Aretas IV is wed to Queen Shuqailat I. Seven coins depicting the king on the obverse as a cuirassed soldier with a sword were retrieved hosting this iconography dating from 7/8/9 CE to 18-20 CE (See Figure 6a &b below).



Figure 6: *Left (a), the obverse of a bronze mint by Aretas IV showing him as a cuirassed soldier with sword and raised right arm and hand. In the right lower field is his 'h' monogram and in the left field is a probable palm branch (?). Right (b), on the reverse is a depiction of the queen as a priestess with a raised right hand in blessing. To the right is an inscription with the queen's name, 'Shuqailat,' and in the left field is either a wreath or a fire*

altar. From AMPP, RI2014-1, Temenos Slot Entrance, Trench B1-SE Corner/SU2. Dated to 18-20 CE. See Meshorer 1975: Coin 97 as comparison. (AMPP 2016).

The king's right arm and hand are raised and a vegetal branch (possibly a palm frond) appear in the lower left field of the obverse of each coin with the king's monograph usually appearing in the lower right. On the reverse of these coins, the new queen appears as a priestess with a right arm upraised with a hand of blessing and with a probable fire altar or ritual wreath in the lower left field with the queen's name inscribed to the viewer's right (See again Figure 6b). In these mints, the new queen Shuqailat, is depicted in the same manner as her predecessor, Queen Huldu.

At Ad-Deir during 2014, coin finds indicate that a second jugate portrait type begins to be issued during the subsequent years of Aretas IV's reign dating from 15 CE down to 39/40 CE with fully half of a total of seven coins of this type minted during 39/40 CE. These coins host jugate portraits of Aretas IV and Shuqailat I on the obverse with Aretas usually hosting a mustache and long loose hair (See Figure 7 a & b). Both the name of the queen and that of Aretas IV appear on the reverse of these coins within the frame of the double cornucopiae. By this era, the double crossed cornucopiae had become a standardized motif on the reverse of bronze coins, although the arms of the cornucopiae on the coins of Aretas IV are usually significantly wider and more highly embellished with ribbons than the earlier uses of this symbol by previous Nabataean kings (See Figure 7b). Additionally, the lower ends of the cornucopiae of Aretas IV may have three different shapes including a 'crows-foot shape with three toes or talons,' an ivy-leaf shape, or with simple pointed ends (See again Figure 7b).



Figure 7a &b: Left (a), the obverse of a coin depicting the jugate portraits of Aretas IV and his wife/queen, Shuqailat. Aretas hosts a mustache and long wavy, loose hair. Both figures are in profile view but the king's right eye is shown as frontal. Both figures wear royal head gear. Right (b), the reverse of the coins hosting a very robust cornucopiae typical of Aretas IV coins. The inscription reads, "Aretas and Shuqailat" with the last two letters of the queen's name between the lower legs of the cornucopiae. AMPP 2014-RI23, Ad-Deir Temenos Slot Entrance, Test Trench B1, against East Wall, SU4. (AMPP 2016).

The loosened wavy hair of Aretas IV is of potential symbolic importance given the carefully arranged snail curl hairstyles of both his other coin types as well as Aretas IV's earlier predecessors. This new hairstyle for Aretas IV, consisting of very long shoulder length hair that hangs straight downward and that is not carefully curled, is an indicator of a change in the political image of the king. The style begins to appear about 25/26 CE and continues to 39/40 CE. It possibly indicates Aretas IV's more active roles as a military leader during conflicts with Judea, rather than the previous visual coin image of the pampered Hellenistic prince.

As noted above, a series of jugate portraits of Aretas IV and Shuqailat increases in frequency in the years 39-40 CE with five examples recovered from the 2014 Ad-Deir excavations of the Temenos Slot (See Appendix I for coins of Aretas IV). An additional two or three coins may have been produced at the same time (See Appendix I for coins of Aretas IV).

Coinage Minted by Malichus II (r. 40-70 BCE)

With the death of Aretas IV in C.E. 40, his son, Malichus II assumes the role of king of Nabataea, presumably with the blessings of Rome. His thirty year reign is second only to his esteemed father's in length, but ends just as Rome's legions, under Vespasian and Titus, are quelling a rebellion in Judea and sieging and destroying both Jerusalem and the Temple of Herod the Great with the assistance of Nabataean troops. The wife/queen of Malichus II is Shuqailat II, however, it is currently unknown what her genetic links to the royal household might have been. While Shuqailat is called 'his sister,' in known inscriptions, there is as yet no evidence that Nabataean royalty practiced brother-sister marriages as did the Ptolemies on occasion in Egypt as well as the royal family of Harlikarnasos in

Asia Minor. Additionally, there existed an ancient tradition in the Near East of using the title of 'sister' as an especially honorary one for an esteemed wife without the term implying a genetic relationship between a husband and his spouse.

The coins of Malichus II are noteworthy in that they often display long inscriptions on the outer edges of the coin itself, however the two examples retrieved by AMPP in 2014 do not. Additionally, the king often wears a V-shaped ornamental headdress. The queen, too, can host such headgear but may also wear a laurate crown. Malichus II revives the circular wreath decoration of his father's earliest coins on the reverse side of his coins, and also maintains the lower silver standard of his father's last mints. Malichus II also extensively utilizes the crossed cornucopiae of his father's bronze mints, but the rendering of these harvest baskets is less refined, the arms are often thinner and more distant from one another, and the lower tails stunted. Malichus II is also noted to have minted the tiniest of Nabataean bronze coins. Significantly, the AMPP excavations of 2014 retrieved two coins



Figure 8 a&b: Left (a), the obverse of a coin with the jugate portraits of Malichus II and Shuqailat II with both figures in profile but the eye of the king in a frontal view dated to 64/65 CE. Right (b), the reverse hosting a thinner cornucopiae and the names of both the king and queen. From AMPP 2014-RI39, Ad-Deir Temenos Slot Entrance, Trench B1, against East Wall, SU5. See Meshorer 1975: Coins 140-141 (AMPP 2016).

from the reign of Malichus II and Shuqailat II. The first is typical of their jugate mints with the reverse hosting their names and a typically thin cornucopiae (See Figure 8a & b). The second coin is the tiniest coin retrieved in 2014 (average

diameter 7.4mm) and even though it is illegible, its small size indicates its association with Malichus II, i.e. it is almost one-half the average diameter size of most Nabataean bronze coins.

Coinage Minted by Rabbel II (r. 70-106 CE to the Roman Annexation)

Rabbel II came into power sometime in CE 70 during the final Roman campaign and mopping up operations against the Jewish Revolt in Judea. He remained king until the Roman Emperor Trajan's annexation of Nabataea in CE 106. Interestingly, Rabbel II was known by the epithet, "He who brings life and deliverance to his people." Whether that deliverance was associated with the conditions of Rome's absorption of Nabataea and Petra into the Empire is not known. Rabbel II is the only Nabataean king for which scholars believe that we have his complete mint series given the findings of the Wadi Murabba'at Hoard that included seventy-nine examples. From 70-75 CE, Rabbel II apparently ruled jointly with his mother Shuqailat II and the AMPP 2014 coins include one example of this probable coin type—a type that is noted for the extremely long necks depicted for the royal couple (See Figure 9a & b).



Figure 9a&b: Left (a), the obverse of a coin minted by Rabbel II with jugate portraits of the king and probably his mother Shuqailat II (?) dated to 75/76 CE. The extremely long necks of the king and queen earmark this as a mint by Rabbel II. Right (b) obverse of the same coins with a cornucopiae and illegible inscription. See for example Meshorer 1975: Coin 146. (AMPP 2016).

Rabbel II's second queen was his wife, Gamilat, and jugate portrait coins were issued from 85-102 CE with their dual images. The AMPP 2014 coins also host one coin of this probable type (See Figure 10 a & b). This type is noted for the

spikey ends of the laurate crowns associated with the headdresses of both Rabbel II and Gamilat and a large inscription on the reverse of the coin encased by the arms of cornucopiae (See again Figure 10 a & b).



Figure 10 a & b: Left (a), the obverse of a coin minted by Rabbel II with jugate and fully profile portraits of the king and his probable new queen Gamilat dated to 85-102 CE. Both the king and queen wear very spikey laurate (?) crowns. Right (b): The reverse of the same coin that is off-struck, with only the tops of the cornucopiae and a damaged inscription between its arms that reads 'Rabbel/Gamilat.' See Meshorer 1975: Coin 163K as a comparison. From the Ad-Deir Temenos Slot Entrance, AMPP2014-RI11, Test Trench B1, against East Wall, SU 4. (AMPP 2016).

Rabbel II's last queen was Hagaru with coins issued from 101-106 C.E. Significantly, none of these types of coins were retrieved by AMPP in 2014, but in these mints Rabbel II wears extremely long, loose hair in his portrait types, mimicking his father Aretas IV, potentially as a military leader with a tribal heritage. Rabbel II also continues to extensively utilize the crossed cornucopiae on the reverse of his bronze coins.

Possible New Coin Types and/or Unknown Types from AMPP 2014

AMPP 2014 also recovered six coins that are currently under further study as they consist of either a completely new Nabataean type that currently cannot be firmly identified, or a coin type that is not Nabataean and therefore must be researched farther afield. Among those coins that appears to be of foreign origins is RI 2014-13 that hosts a beautifully rendered portrait facing right on the obverse and some type of vegetal plant on the reverse (See Figure 11 a & b).

The features of the portrait are highly Hellenized with a long finely shaped nose, small lips, and a protruding chin. The plant on the reverse also begs research.



Figure 11 a&b: Left (a), Hellenized portrait facing right of an unknown deity or king. Left (b), reverse of this same coin with an unidentified vegetal motif and damaged inscription.(AMPP 2016).

The profile does not quite match that of known coins of Aretas II, Aretas III, or Obodas II or any of the later Nabataean kings. The reverse is completely unique. RI 2014-62 is also extremely enigmatic (See Figure 12 a & b). It hosts a male



Figure 12 a & b: Left (a), the obverse of RI2014-62 with a male portrait bust facing right and possibly wearing military attire along with a damaged inscription in the left field of the coin. Right (b), a female portrait facing right with strange headgear.(AMPP 2016).

portrait potentially in military garb on the obverse with an obscured inscription. A large nosed female figure hosting a dramatic spiked, rooster comb-like

headdress (possibly turreted towers as in Tyche examples), is depicted on the reverse. The coin is unlike any currently known from Nabataean mints.

RI 2014-36 hosts a male portrait facing right on the obverse and a standing female figure in composite view facing right on the reverse with her arms distended and the remains of either wings or five raised lines/columns? positioned behind her on either side of her body (See Figure 13 a & b). The buttocks and breast areas of this female body protrude, but the head and face are worn away. This coin is closest to one of the so-called ‘Anonymous’ coins discussed by Schmitt-Korte so the Ad-Deir Plateau coin could possibly be a mint of Aretas III dated to c. 84 B.C.E. If this example is one of these earliest coins of Nabataea, it is significant that it was recovered from the Ad-Deir Plateau and pushes back the use of the Plateau by the Nabataeans to this date.

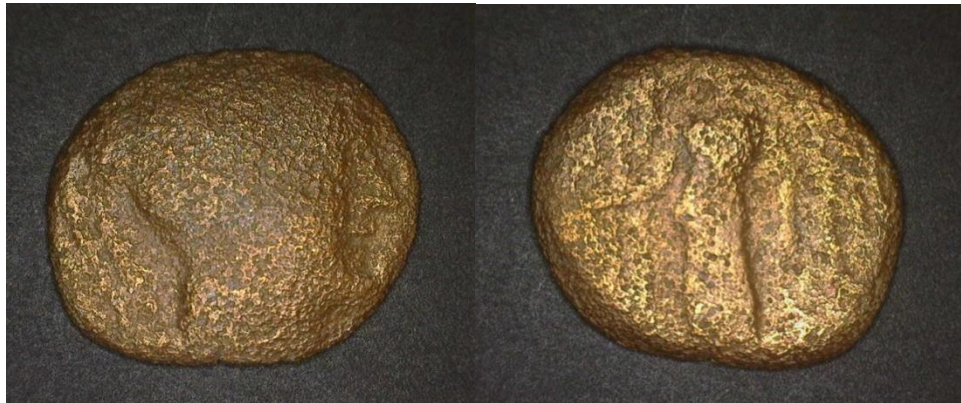


Figure 13 a&b: Left (a), the obverse of an unknown or ‘Anonymous Mint’ coin from Nabataean contexts possibly from the era of Aretas II or III and dating to c. 84 BCE? Right (b), the reverse with a woman in composite view with a large breast line and arms extended situated in front of wings or possible columns (?). From the Ad-Deir Monument Temenos Slot Entrance RI2014-36, Trench B1, against East Wall, SU5.(AMPP 2015).

RI 2014-78 may be a possible new type of Aretas IV with a worn jugate portrait on the obverse and partially off-struck cornucopiae on the obverse (See Figure 14 a & b). The



Figure 14 a&b: Left (a), obverse of a worn jugate portrait type with the king wearing high heavy head gear. Right (b), reverse of the same coin with a highly embellished cornucopiae usually seen on coins of Aretas IV. A probable 'h' monogram letter can be seen in the center between the arms of the cornucopiae. From the Ad-Deir Temenos Slot Entrance, RI2014-78, Trench B3-north, SU2. (AMPP 2016).

jugate portrait type is slightly different from the known Aretas IV examples. The cornucopiae are typical of the embellished types from the coinage of Aretas IV and additionally, it hosts ivy leaf-shaped feet and a 'H' between the two upper arms of the cornucopiae.

RI 2014-21 is also a possible new Aretas IV portrait type (See Figure 15 a & b).



Figure 15 a&b: Left (a), obverse of a possible new early Aretas IV portrait type dated to c. 6 BCE to 18 CE. The portrait's facial appearance and headgear are slightly different from other early portrait types for this king. See for example, Meshorer 1975: Coin 73A. Right (b), reverse of the same coin with crow's-foot cornucopiae and a possible 0 between the upper arms. See again, Meshorer 1975: Coin 73A as a comparison. From the Ad-Deir Temenos Slot Entrance, RI2014-26, from Trench B1, against the Eastern Wall, SU4. (AMPP 2016).

RI 2014-96 is also a potential new Rabbel II and Shuqailat II Type hosting a portrait of each individual on the obverse and reverse of the coins respectively (See Figure 16 a & b). The long neck of the male on the obverse seemingly associates it with Rabbel II with his queen Shuqailat II on the obverse. However, this is a tentative identification requiring further comparisons and research.



Figure 16 a & b: Left (a), the probable obverse of a possible new Rabbel II coin issue with a male portrait with long neck facing right. Right (b), the probable reverse of the same coins hosting a probable female (?) portrait facing right. From the Ad-Deir Temenos Slot Entrance, RI2014-96, from Trench B2, middle, SU3.(AMPP 2016).

Analysis and Conclusions

It is obvious that the mints of Aretas IV dominate the 2014 coin finds on the Ad-Deir Plateau. Of the sixty-nine total coins retrieved, eleven are illegible and ten are indeterminate. Forty-eight coins can thus be identified, but six of those are as yet unique and require further research as they may represent previously unknown Nabataean mints and at least one or two foreign imports. Forty-two coins can thus be firmly associated with a Nabataean monarch. Of those forty-two coins, thirty-six are definitely mints of Aretas IV, with another ten indeterminate coins possibly associated with him in addition to two or three of the new coin types also possibly minted by this long-lived Nabataean monarch. Additionally, of the firmly identifiable mints of Aretas IV retrieved from the Temenos Slot Entrance of the Ad-Deir Monument, the majority of these coins were minted in 4-3 BCE (15 out of 36 coins or 42%), and 14-40 CE (9 out of 36 coins or 25%), and 39-40 CE (7 out of 36 coins or 19%). Significantly, Aretas IV participated in the expedition of the Roman general Varus against Judea in 4 BCE

and put a large portion of the Nabataean army under Varus' disposal. Again, in the winter of 36/37 CE, Aretas IV was in conflict with Herod Antipas concerning Herod Antipas' famous extra marital affair with a brother's spouse that eventually caused the decapitation of John the Baptist. Herod' Antipas' legitimate wife was the daughter of Aretas IV, and this marriage had to have been politically critical in bringing the two kingdoms together as a united front in the face of increased Roman control in the region. The marriage's dissolution via Herod Antipas' extra marital affair was potentially seen by Aretas IV as not only a slight against the honor of his daughter, but also a dangerous political breach that compromised the quasi-independence of both kingdoms in the face of rising Roman dominance in the region. And, indeed, when Aretas IV marched against Herod Antipas, Herod Antipas called on Roman legions to protect him, thus bringing Roman military might more directly and forcefully back into the day-to-day lives of both Judea and Nabataea. Rome thus began to rely less and less on client kingdoms in Judea and Nabataea over time and maneuvered more and more to gain direct control over these lucrative accesses to valuable trade routes and agricultural resources. Mints of Aretas IV also increase around the date of 16 CE to commemorate his marriage to Queen Shuqailat I.

The coins and thus archaeological evidences retrieved by AMPP in 2014 thus verify the accounts of Josephus with increased mints instituted by Aretas IV during eras of military activities in order to pay Nabataean troops. The concentration of these coins on the Ad-Deir Plateau in the small defined area of the Temenos Slot Entrance of the Ad-Deir Monument complements other archaeological evidences that point to the assumption that the Plateau served as a strategically protected safe haven high above the more easily attacked lower city, and that the Plateau was intensely utilized during the reign of Aretas IV when potential political instability via military endeavors by the Nabataeans is historically documented. The huge water retention installations on the Plateau in addition to possible large storage magazines mapped via AMPP-GPS also lend support to the role of the Ad-Deir Plateau as a possible strategic palace and mint storage location at least during the time of Aretas IV if not before. Given extant coins, these activities on the Ad-Deir Plateau continued into the last years of the reign of Rabbel II and then abruptly ended with the official absorption of Petra

into the Roman Empire under Trajan in CE 106. Significantly, pottery finds seemingly substantiate the above, with the greatest deposits consisting of a majority of Nabataean fine wares dated to the late first century B.C.E. to the early first century C.E. Furthermore, pottery also indicates that the uses of the Ad-Deir Plateau declined after the Roman annexation of Petra in C.E. 106. This would be a logical event if the patronage of a royal Nabataean family for a strategic complex at Ad-Deir disappeared with the dissolution of the Nabataean monarchy after that date. The intensity of the use of the Ad-Deir Plateau during the reign of Aretas IV also brings into question the association of the Ad-Deir Monument with this monarch, rather than with the deified Obodas III (30-9 BCE) as has been suggested by F. Zayadine and S. Farajat in 1991. Continued research on the coins retrieved in the 2015, 2016, and 2017 AMPP work seasons may add further information to the above study. The coins retrieved during the 2014 season of AMPP, however, reveal new and important information concerning the strategic uses of the Ad-Deir Plateau during the reign of Aretas IV and help to explain the presence of the vast cistern and potential storage complexes on this easily defended plateau that towers above the ancient city of Petra.

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APPENDIX A--THE AD-DEIR MONUMENT & PLATEAU PROJECT SEASON 2014 ANCIENT COIN RETRIEVAL: ANALYSIS & SYNOPSIS AD-DEIR TEMENOS SLOT

ILLEGIBLE COINS (No extant imagery)

| | | |
|------------|-----------------------|-------|
| RI 2014-9 | Trench B1-E. Wall/SU4 | _____ |
| RI 2014-32 | Trench B1-E. Wall/SU4 | _____ |
| RI 2014-37 | Trench B1-E. Wall/SU5 | _____ |
| RI 2014-41 | Trench B1-E. Wall/SU5 | _____ |
| RI 2014-45 | Trench B1-E. Wall/SU5 | _____ |
| RI 2014-77 | Trench B2-Middle/SU3 | _____ |
| RI 2014-80 | Trench B2-Middle/SU3 | _____ |
| RI 2014-83 | Trench B2-Middle/SU3 | _____ |
| RI 2014-87 | Trench B3-North/SU2 | _____ |
| RI 2014-90 | Trench B2-Middle/SU3 | _____ |
| RI 2014-91 | Trench B2-Middle/SU3 | _____ |

INDETERMINATE COINS (Some extant imagery but incomplete)

| | | |
|---|--------------------------|--------------------------------------|
| RI 2014-92 | Trench B2-Middle | Obodas III thru Rabbel II |
| 25/24 BCE thru 101/102 CE | | |
| RI 2014-74 | Trench B3-North/SU2 | Obodas III onward |
| 25/24 BCE to 106 CE | | |
| RI 2014-72 | Trench B3-North/SU2 | Obodas III, or Syllaeus or |
| 24/23 BCE | Aretas IV down to 5/6 CE | |
| RI 2014-14 | Trench B1-E. Wall/SU4 | Either Aretas IV or Malichus II |
| 7 CE to 70 CE | | |
| RI 2014-16 | Trench B1-E. Wall/SU4 | Either Aretas IV or Malichus II |
| 5/6 CE to 70 CE | | |
| RI 2014-42 | Trench B1-E. Wall/SU5 | Either Aretas IV & Shuqaillat |
| 39-40 CE or Malichus II & Shuqaillat II | | 64-65 CE |
| RI 2014-47 | Trench B1-E. Wall/SU6 | Either Aretas IV or Rabbel II |
| 39-40 CE or 70-106 CE | | |
| RI 2014-79 | Trench B3-North/SU2 | Either Aretas IV or Rabbel II |
| 39-40 CE or 70-106 CE | | |
| RI 2014-85 | Trench B3-North/SU2 | Either Aretas IV or Rabbel II |
| 39-40 CE or 101-102 CE | | |
| RI 2014-40 | Trench B1-E Wall/SU5 | Aretas IV & Shuqaillat |
| 39-40 CE | Dual Portrait Type or | Malichus II & Shuqaillat II 64-65 CE |

THE CURRENTLY ACCEPTED NABATAEAN KING LISTS

ANONYMOUS KINGS (beg., c. 3rd century BCE) with DEBATED COINAGE

ARETAS I (c. 168 BCE)

No coins from Ad-Deir for 2014

RABEL I (? Late 2nd Century BCE)

No coins from Ad-Deir for 2014

ARETAS II (c. 103-96 BCE) or ARETAS III-Philh. (c. 87/86-72 BCE)

No coins from Ad-Deir in 2014

OBODAS II (62/60-59 BCE)

| | | | |
|------------|----------------------|-------------|--------|
| RI 2014-68 | Trench B2-Middle/SU3 | Diadem Type | 60 BCE |
|------------|----------------------|-------------|--------|

MALICHUS I (60/59-30 BCE)

No coinage from Ad-Deir Project in 2014

OBODAS III (30-9 BCE)

See Indeterminate Coinage Above- 3 Possible examples?

SYLLAEUS (9 BCE)

| | | | |
|------------|--------------------|--------------|-------|
| RI 2014-57 | Trench B3-Nort/SU1 | Syllaeus (?) | 9 BCE |
|------------|--------------------|--------------|-------|

ARETAS IV- 'He who loves his people' (9 BCE-40 CE)

| | | | |
|-------------|-------------------------|---------------------------------------|----------|
| RI 2014 -17 | Trench B1-SW Corner/SU1 | Aretas IV Indeterminate type and date | |
| RI 2014-18 | Trench B1-E. Wall/SU1 | Aretas IV Indeterminate type and date | |
| RI 2014-20 | Trench B1-E. Wall/SU4 | Aretas IV Indeterminate type and date | |
| RI 2014-26 | Trench B1-E.Wall/SU4 | Aretas IV Portrait Type (?)9 BCE-18CE | |
| RI 2014-48 | Trench B1-E. Wall/SU6 | Aretas IV Portrait Type | |
| 9BCE-3BCE | | | |
| RI 2014-3 | Trench B1-SE Corner/SU3 | Aretas IV Portrait Type | 4-3 BCE |
| RI 2014-12 | Trench B1-E.Wall/SU4 | Aretas IV Portrait Type | 4-3 BCE |
| RI 2014-15 | Trench B1-E Wall/SU4 | Aretas IV Portrait Type | 4-3 BCE |
| RI 2014-63 | Trench B2-Middle/SU3 | Aretas IV Portrait Type | 4-3 BCE |
| RI 2014-67 | Trench B2-Middle/SU3 | Aretas IV Portrait Type | 4-3 BCE |
| RI 2014-71 | Trench B2-Middle/SU3 | Aretas IV Portrait Type | 4-3 BCE |
| RI 2014-73 | Trench B3-North/SU3 | Aretas IV Portrait Type | 4-3 BCE |
| RI 2014-75 | Trench B2-Middle/SU3 | Aretas IV Portrait Type | 4-3 BCE |
| RI 2014-76 | Trench B2-Middle/SU3 | Aretas IV Portrait Type | 4-3 BCE |
| RI 2014-93 | Trench B2-Middle/SU3 | Aretas IV Portrait Type | 4-3 BCE |
| RI 2014-95 | Trench B2-Middle/SU3 | Aretas IV Portrait Type | 4-3 BCE |
| | | or | 39-40 CE |

ARETAS IV CONTINUED

| | | |
|-------------|-----------------------|------------------------------|
| RI 2014-30 | Trench B1-E. Wall/SU4 | Aretas IV Portrait /Caduceus |
| 4-3BCE | | |
| RI 2014-31 | Trench B1-E. Wall/SU4 | Aretas IV Portrait /Caduceus |
| 4-3 BCE | | |
| RI 2014-100 | Trench B2-Middle/SU3 | Aretas IV Portrait /Caduceus |
| 4-3 BCE | | |

| | | | |
|--------------------------------|-------------------------|------------------------------|----------|
| RI 2014-27 | Trench B1-E. Wall/SU4 | Aretas IV Portrait Type | |
| 5/56 CE | | | |
| | | Laurate Portrait | |
| RI 2014-29 | Trench B1-E. Wall/SU4 | Aretas IV Portrait Type | |
| 18 CE onward | | | |
| | | Rev. Wreath Type | |
| RI 2014-33 | Trench B1-E. Wall/SU4 | Aretas IV Portrait Type | |
| 39-40 CE | | Rev. Wreath Type | |
| ===== | | | |
| ===== | | | |
| RI 2014-24 | Trench B1-E. Wall/SU4 | Aretas IV & Shuqailat | 7-8/9 CE |
| | | Soldier/Priestess Type | |
| RI 2014-25 | Trench B1-E. Wall/SU4 | Aretas IV & Shuqailat | 7-8/9 CE |
| | | Soldier/Priestess Type | |
| RI 2014-28 | Trench B1-E. Wall/SU4 | Aretas IV & Shuqailat | 7-8/9 CE |
| | | Soldier/Priestess Type | |
| RI 2014-1 | Trench B1-SE Corner/SU2 | Aretas IV & Shuqailat | 18-20 CE |
| | | Soldier /Priestess Type | |
| RI 2014-49 | Trench B1-E. Wall/SU6 | Aretas IV & Shuqailat | 18-20 CE |
| | | Soldier/Priestess Type | |
| RI 2014-82 | Trench B2-Middle/SU3 | Aretas IV & Shuqailat | 18-19 CE |
| | | Soldier/Priestess Type | |
| RI-2014-99 | Trench B2-Middle/SU3 | Aretas IV & Shuqailat | 18-19 CE |
| | | Soldier/Priestess Type | |
| ===== | | | |
| ===== | | | |
| RI 2014-23 | Trench B1-E. Wall/SU4 | Aretas IV & Shuqailat | 15-25CE |
| | | Dual Portrait Type | 25-40 CE |
| RI 2014-10 | Trench B1-E. Wall/SU4 | Aretas IV & Shuqailat | 18-25 CE |
| | | Dual Portrait Type | 25-40 CE |
| RI 2014-58 | Trench B3-North/SU2 | Aretas IV & Shuqailat | 39-40 CE |
| | | Dual Portrait Type | |
| RI 2014-59 | Trench B1-North/SU2 | Aretas IV & Shuqailat | 39-40 CE |
| | | Dual Portrait Type | |
| RI 2014-64 | Trench B2-Middle/SU3 | Aretas IV & Shuqailat | 39-40 CE |
| | | Dual Portrait Type | |
| RI 2014-65 | Trench B2-Middle/SU3 | Aretas IV & Shuqailat | 39-40 CE |
| | | Dual Portrait Type | |
| RI 2014-84 | Trench B2-Middle/SU3 | Aretas IV & Suqailat | 39-40 CE |
| | | Dual Portrait Type | |
| ===== | | | |
| ===== | | | |
| <u>MALICHUS II (40-70 CE)</u> | | | |
| RI 2014-39 | Trench B2-E. Wall/SU5 | Malichus II & Shuqailat II | 64-65 CE |
| RI 2014-52 | Trench B1-E. Wall/SU6 | Malichus II (miniature coin) | 64-65 CE |

See also Indeterminate Examples above-4 possible examples

RABBEL II “Who brings life and deliverance to his people” (70-106 CE)

| | | | |
|------------|----------------------|-------------------------------|----------|
| RI 2014-98 | Trench B2-Middle/SU3 | Rabbal II & Shuqaillat II (?) | 75-76 CE |
|------------|----------------------|-------------------------------|----------|

RI 2014-11 Trench B1-E. Wall/SU4 Rabbat II & Gamlat (?) 85-102 CE

See also Indeterminate Examples above-4 possible examples

POSSIBLE NEW TYPES (6)

RI 2014-13 Trench B1-E. Wall/SU4 Unknown New Portrait Type ?

Ri 2014-62 Trench B2-SU3 Unknown New Portrait Type ?

RI 2014-36 Trench B1-E.Wall/SU5 Anonymous Coins from ?
 Schmitt-Korte or possible
 Aretas III 84 BCE

RI 2014-78 Trench B3-North/SU2 Possible New Aretas IV, after 6 CE and
 probably 39-40 C.E.

RI 2014-21 Trench B1-E. Wall/SU4 Possible New Aretas IV 6BCE-18 CE
 Portrait Type

RI 2014-96 Trench B2-Middle/SU3 Possible New Rabbat II & 75-76 CE
 Shuqailat Type

ANALYSIS TOTALS

69 Coins recovered

- 11 Illegible coins

58 Subtotal of coins minus illegible coins

- 10 Indeterminate coins

48 Subtotal of coins minus illegible coins +indeterminate coins

- 6 Possible foreign coins or new Nabataean types

42 Identifiable Coins of which 36 are Aretas IV (only 6 coins are from other
 Nabataean Monarchs= 36/42 =86% of total identifiable coins=Aretas IV

FROM AN ECONOMIC SOURCE TO A CULTURAL RESOURCE: COMMUNITY ENGAGEMENT IN ARCHAEOLOGY AND CRM AS A MEAN FOR SUSTAINABLE TOURISM AND PRESERVATION

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Abstract

Too often archaeological sites are perceived by the surrounding communities only as an economic source. This statement is particularly true in Jordan where - a yet difficult to overcome - colonial past has dominated both the fields of archaeology and CRM for years.

Traditionally local communities are looked at as laborers' basins and are given little or no opportunities to actively participate in the management of their own heritage. This situation enhanced over the past two centuries a sense of alienation that negatively affected the local ability to preserve such a heritage.

With the raise of community archaeology as a new discipline, local communities are gaining back the necessary centrality in the discourse around their heritage. This inversion in the trend is also highly impacting the long-term preservation of archaeological sites: local communities are increasingly looked at as a resource for a more sustainable preservation of the heritage and many projects in Jordan have pioneered this grassroots approach over the last two decades.

The establishment of the Department of Antiquities and the fencing of antiquities sites, the increasing number of foreign missions in Jordan and mass tourism all contributed to consolidate the assumption that archaeological sites are valuable only as tourist destinations.

Archaeological and CRM projects in Jordan have been dominated by the persistent legacy of colonial past. Attempts to overcome the colonial past have

amounted to pouring money into the country to implement projects that are still managed predominantly by foreigners, and based on foreign institutions and cultural assumptions. Projects often create economic and cultural dependency rather than empowering local residents.

The rise of community archaeology is inverting this trend and local communities are gaining back centrality in the discourse around their heritage. Local communities are looked at as a resource for a more sustainable preservation of the heritage and several projects have pioneered this grass-root approach over the last two decades.

Two of those grass-roots projects were pivotal in the genesis of Sela for Vocational Training and Protection of Cultural Heritage, a not-for-profit local company. The company, founded in 2015, promotes the participation of host communities in CRM. The active participation foreseen by Sela is possible only by building local capacity and formalizing the CRM job market.

Introduction

Archaeological sites are often perceived by the surrounding communities only as an economic source (Ronza, 2016). The idea that archaeology must be combined with tourism is firmly consolidated and its roots extend far back in time.

With the establishment of the Department of Antiquities of Jordan in 1923 and Jordan's first antiquities law in 1934 and its subsequent amendment no. 21 in 1988, most archaeological sites were defined and fenced, creating the first disconnect with the communities living in the surroundings. Since the early days of the British mandate, and increasingly during the sixties and seventies, archaeological, and later CRM, projects in Jordan have been almost exclusively conducted in cooperation with or by foreign missions. This situation has engendered and consolidated over the years a sense of alienation within the communities towards their own heritage. Before the seventies, when most archaeological sites were not fenced, they were integral part of the life of the surrounding communities because of their historical value and were perceived as part of the urban tissue of villages and towns. Therefore archaeological and heritage sites were lively places, embedded in the living memory of the communities (Damick and Lash, 2013), even if the many ongoing activities often

endangered the preservation of the site (e.g., exploitation for building materials). Because of such activities, communities are still often considered a threat more than a resource for the site.

Following the fencing of sites and amplified by the increasing number of foreign projects working in the country and by mass tourism in the eighties and nineties, the social perception of archaeological sites began to change and the focus shifted from cultural and historical value to touristic value. Archaeological sites became immutable, musealized, isolated compartments in the urban tissue, subjects of scientific investigations and tourist destinations. These changes limited the direct interaction of the communities with the sites. Archaeological sites nowadays are, in fact, mainly viewed by their host communities as an economic source for tourist exploitation or as a source of seasonal jobs within archaeological projects. Communities no longer value archaeological sites as their own heritage, as the representation of their own past, or as a cultural resource to learn and showcase their own history, but just merely as a means to draw tourists to the country.

Petra represents a paradigm of this shift in perspective: Bedouin lived inside the archaeological site up to the late eighties, when they were forcibly moved out and settled in the nearby village of Umm Sahyoun that was built to host their community. Since then, a vast majority of them make their living by selling trinkets or providing services to tourists (e.g., cold drinks and snacks, camel and donkey rides) within the archaeological site. Petra housed those tribes for centuries: from an historical and archaeological point of view the Bedouin represent the last occupational stratum of the site. So can we consider their presence a threat to the site in the first place?

In this case the shift was sudden and the local perception was that mass tourism was prioritized over local residents (Mickel and Knodell, 2015). This shift was embraced by the local population with the creation of several tourist-centered commercial activities within the site. When most of the Bedouin moved out of Petra in the late eighties/early nineties mass tourism was just blooming in Jordan and rapidly increased after the peace treaty between Jordan and Israel in

1994²¹. The influx of tourism cash created expectations in the local population and increasingly devalued the historical and archaeological significance of the site over its importance as an economic income generator.

The sustainable preservation of the site was not part of the equation even just in terms of awareness about the fragility of the site and the need for its preservation in order to sustain economic generation. Before moving out, the Bedouin in their re-use of the monuments contributed also to their maintenance and preservation, not up to international conservation standards, but yet they would upkeep the site because it was their home. Once they moved out, their involvement in the protection of the site shifted to menial seasonal jobs and the focus shifted on the income from tourists, whose unregulated presence has been itself a threat to site (Paradise, 2012).

The persistence of the colonial legacy

Over the past two centuries, archaeological and CRM projects in Jordan have been dominated by a persistent legacy of the colonial past. The vast majority of those projects is funded, directed and managed by foreign missions.²²

Abu-Khafajah observes: "in Jordan, 'archaeology' as a term (its Arabic translation is *athar*) is strongly associated with foreign and authoritative expeditions' excavations conducted on people's land, before, during and after the British Mandate in Jordan after World War I. Archaeology in this sense is a colonial term, tool and practice" (Abu Khafajah, 2014:149).

Foreign missions have come into the country for years with their agendas and their experts to extract raw data, then return to their institutions to process and add value to it. Within this framework very often local communities' involvement has been limited to minimum wage, seasonal jobs which only improve or build local capacities at the most menial level. The lack of job categories, formal training for technicians and certifications have created a situation in which

<http://mit.gov.jo/EchoBusV3.0/SystemAssets/PDFs/AR/Departements/ForeignTradePolicy/Tourism.pdf> - page 21
5 [accessed 27 September 2017]

²²The Jordanian General Budget Department in the section 1802 of Law No.(2) for the Year 2017, General Budget Law for the Fiscal Year 2017 uses the number of foreign projects as the solely performance indicator for their strategic objective 1 "To preserve the archaeological and urban resource."
<http://www.gbd.gov.jo/GBD/en/Budget/Index/general-budget-law> [accessed 22 July 2017]

projects tend to hire laborers at a flat rate even if they are selected for their acquired skills, while the dig directors intentionally disregard those skills vis-à-vis pay-scale and job definitions. Furthermore currently hiring in CRM projects, both at professional and technical level, is based on personal reputation and – especially in the case of laborers – the more skilled they are, the fewer their opportunities (Mickel, 2016).

This passive approach to heritage within the host communities is enhanced by the systemic dependency from external funds, which feeds a continuously increasing culture of welfare. Efforts advertised as attempts to overcome the colonial past in fact have amounted to pouring money into countries that were once colonies to implement projects that are still managed predominantly by foreigners, and based on foreign institutions and cultural assumptions. This has tended to instill the notion that any foreign system is better than an existing local one. Projects often create economic and cultural dependency without empowering local residents to build sustainable income generated by cultural heritage management.

Even community archaeology projects are too often not locally sustainable, either economically or in terms of procedures and adherence to local existing legislation.

Two main intertwined factors generate this glitch: (1) the funding system itself, administered by for-profit contracting agencies which fail to grasp local voices and contributions over the necessity of producing statistically relevant successful data, (2) the geo-social configuration of Jordan, in which Amman, where these agencies are based, is the only structured urban center, and the rest of the country, which is perceived as remote, rural and backwards.

These two factors are crucial in the perpetuation of a system which conveniently increases welfarism at the expense of local sustainability.

This culture of welfare contributes to lowering qualitative standards in preservation work, because it shifts the focus from sustainable preservation of the heritage to the wellbeing of the communities. The result is a qualitatively poor local capacity building, which indefinitely requires improvement, creating a vicious circle that perpetuates the *status quo*.

In this scenario site preservation is neglected or poorly accomplished in favor of wealth redistribution.

Furthermore “capacity building” often results in training which does not accrue towards actual employment, due to the informal nature of the CRM job market in Jordan.

Community archaeology and local sustainability: Sela for Vocational Training and Protection of Cultural Heritage

Over the last two decades, the rise of community archaeology has begun to reverse this trend and local institutions have started to look at communities as a resource for sustainability. *The Strategy for Management of Jordan's Archaeological Heritage*, published in 2014 by DOA²³ expressly mentions community involvement as an underlying principle, and local communities and NGOs are considered a positive resource.

This inversion in the trend is also impacting the long-term preservation of archaeological sites. Local communities are increasingly looked at as a resource for more sustainable preservation of the heritage and many projects in Jordan have pioneered this grass-roots approach over the last two decades (LaBianca, Harris and Ronza, forthcoming).

One such project is the Andrews University project at Tell Hesban. The project has pioneered community archaeology in Jordan since its inception in the late sixties (Picture 1), but community engagement has become the focus of the project over the past two decades, under the directorship of Andrews University anthropologist, Dr. Oystein LaBianca. Serving on the project as local coordinator and co-director, Maria Elena Ronza helped to systematize the holistic approach of the project into a model pursuing a more central role for the host community in the management of the site (LaBianca, forthcoming). In addition to starting an employment roster, based on tribes, families and single households, the project fostered collaborations with local schools, organizing community events on site in order to revive and awaken the dormant collective memory of the site. The

²³<http://inform.gov.jo/en-us/By-Date/Report-Details/ArticleId/196/The-Strategy-for-Management-of-Jordan-s-Archeological-Heritage> [accessed 22 July 2017]

restitution of the site to the life of the host community fueled a new sense of ownership towards the site and its history.



Picture 1 – Group shot of the Hesban team in the seventies. (Courtesy of Andrews University)

The model piloted at Tell Hesban has been adopted and further developed by the Temple of the Winged Lions Cultural Resource Management (TWLRM) initiative in Petra (Ronza, 2016), where Ronza served first as project manager (2012 – 2014) and then as project co-director (2014 – 2017). Fieldwork at the Temple of the Winged Lions in Petra started in the summer of 2012, under the directorship of Dr. Christopher Tuttle. TWLCRM initiative introduced many innovations and paved the ground for a more responsible and participated approach of the host communities to the archaeological site. The continuity of the project, which has been in the field uninterruptedly since 2012, made those innovations possible, allowing it to pervade the host communities and strengthen their connection with the site and the heritage. As at Tell Hesban, with the beginning of the project, we started a roster-arranged by communities, tribes, families, single households. Names are registered on a "first come-first serve" basis and people are divided in categories on the basis of their qualifications and work experience. Even if those categories are meaningful only to the TWLCRM project, establishing a pay-scale based on acquired experience meant giving value to the

training opportunities offered. The gender-blind, *wasta*-free, skill-based hiring system has boosted the sense of ownership within the communities and has helped to create a fertile ground for local engagement. The project hired over 800 persons (about equal number of men and women) in five years between 2012 and 2016 (Tuttle, Corbett and Ronza, forthcoming).

The involvement of women in the project constituted a challenging innovation, as traditionally women would be hired on archaeological projects only to prepare food or to wash pottery. The TWLCRM initiative promoted since its beginning a gender-blind hiring strategy and numerous women registered for the different jobs and training opportunities offered. The involvement of women was crucial in passing the message to future generations and helped considerably in raising awareness within the host communities.



Picture 1 – TWLCRM local in February 2014. (Photo credit: Ghaith AlFaqeer – Photo source: <https://www.facebook.com/TWLCRM/photos/a.362400327193478.1073741829.362247637208747/471668279600015/?type=3&theater>)

TWLCRM has demonstrated the potential of host communities to participate constructively in all aspects of CRM from strategy to the preservation and presentation of archaeological and heritage sites.

In 2015, five members of the TWLCRM team founded Sela for Vocational Training and Protection of Heritage aiming to expand and formalize the holistic model of the TWLCRM initiative.

Sela is a non-profit organization registered at the Jordanian Ministry of Industry and Trade. The board is directed by Ms. Eman Abdassalam and the vice president is Mr. Ahmad AlMowasa, Shaker AlFaqeer, Maria Elena Ronza and Bassam AlFaqeer are the other board members and founders (Picture 2).



Picture 2 -Sela founders and board members: standing from left to right Eman Abdassalam and Maria Elena Ronza; sitting down from left to right Ahmad Mowasa, Shaker AlFaqeer and Bassam AlFaqeer. (Photo credit: Halemah Nawafleh)

Sela's main objectives are to build local capacity for CRM preservation and to raise awareness about Jordan's cultural heritage and archaeology within host communities.

Raising awareness within host communities is crucial to the sustainable preservation of archaeological sites because sustainability begins with daily acts of care, such as picking up trash or report looting to relevant authorities (Ronza, 2016).

Sela also offers training opportunities within the host communities (Picture 3).



Picture 3 – First group that completed their training in different aspects of CRM in December 2015 as part of Sela CRM training program at the Temple of the Winged Lions in Petra. (Photo credit: Eman Abdassalam)

Since Sela was founded in 2015, the company has implemented several projects in which local community members were trained on the job within foreign projects in Jordan. Sela managed local staff and built local capacity in each site with the aim of creating a workforce to sustain each project in the years to come. This approach is tailored to the needs of the projects and the sites and by implication is tailored to the available job opportunities (Picture 4).



Picture 4 - Sela trainer, Ahmad Mowasa, and the three trainees from the Amarin village (sitting down) with the Ba'ja excavation team directed by Dr. David Graf from University of Miami. (Photo credit: Shane Suzuki – Photo source:

<https://www.facebook.com/trainingsela/photos/a.246009469223741.1073741827.244456699379018/246009459223742/?type=3&theater>

As a local company, Sela offers contracts with benefits both to its trainers and trainees, which is a critical step towards the formalization of the CRM job market.

Beginning in summer 2017, Sela hosted four students from the Faculty of Architecture of the Hashemite University for their summer internship semester. Jordanian university students have little opportunities to experience fieldwork in CRM before graduation. Sela successfully piloted this program and offered several opportunities to the students who served in different capacities on international projects (Picture 5-7).



Picture 5: One of the Hashemite students, Ahmad Daffar, is learning how to prepare lime mortar with Sela trainer, Ahmad Mowasa. (Photo credit: Halemah Nawafleh)



Picture 6 – Hashemite students working together with the architecture students of the Tall Hesban Archaeological Park Project at the design of a new welcoming center and an entry gate for the archaeological site of Tell Hesban. (Photo credit: Safa Abu Joudeh)



Picture 7 – One the interns from the Hashemite University, Safa Abu Joudeh, illustrating the project of the gate and the welcoming center at the Municipality of Hesban. (Photo credit: Maria Elena Ronza)

In offering marketable training opportunities, Sela at the same time builds its own capacity as a training company. Sela initiated a basic database of skilled/trained technicians in 2015 that will serve as an internal tool to recruit trainers within Sela's project, but also as a tool for other projects to identify and recruit skilled laborers.

Sela is still unique in the Jordanian CRM horizon, but it represents the type of genuinely local development which can accomplish huge steps towards sustainable preservation, which is tightly intertwined with sustainable tourism.

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INTERVENTIONS OF RESTORATION IN THE CHURCH OF THE PAPHOS OF PETRA, 2004 AND 2011-12

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Abstract

The Archaeological excavation of the Byzantine church of Petra began in May 1992, conducted by the American Center of Oriental Research (ACOR) and Dr. Kenneth Russel, who died tragically at the beginning of the excavation. The conservative conditions of the site appeared immediately precarious, also because the church had been destroyed by a fire. The first restoration works begin almost immediately by the restorer Livia Alberti and later in 1997 by Claudia Tedeschi and Enzo Aiello. This presentation is mainly about my restoration work in 2004, 2011 and 2012. In conservative intervention in 2004, a more accurate state of conservation research was carried out and conservative intervention was focused above all on the most obvious mosaic detachment and swelling. After the restoration, ACOR carried out an ordinary maintenance program with two local operators in the nearby village of Umm Say Hum. In the summer of 2011 at the request of the Director of ACOR, Dr. Barbara Porter, I did an inspection and compiled a map of the state of conservation, this mapping was then compared to that of 2004, and the result was that the The process of degradation had increased in a worrying way. After this analysis, with Dr. Barbara Porter we decided to prepare a new project for the preservation of the entire mosaic. From October 2011 to December 2012, four work campaigns were carried out, with various important steps to stop the process of degradation and restore the preservation of the mosaic. In addition to the mosaic, the preservation was extended to the opus sectile of the floor, to the plaster walls and the columns that divide the churches into three aisles. A large-scale fire led to the destruction of Petra's church around 600 BC. With the excavations carried out by ACOR since 1992, the marvelous mosaic of the two lateral aisles was also brought to light, the mosaic using local stone and even large,

gave a display of his artistry and technical mastery. The fire has damaged a good part of the mosaic and the architectural structures, with considerable damages even beneath the mosaic on the preparatory layers.

The first restorations were carried out by experienced restorers such as Livia Alberti and Fatma Mari, directed by Thomas Roby.

In 1997 another conservative intervention was carried out by the restorers Claudia Tedeschi and Enzo Dicarlo with the assistance of two students from the Madaba Mosaic School, Majdi Ghaith and Mohammad Ramahi.

In 2004, at the request of then director of ACOR Dr. Pier Bekai, I was called for an intervention on the mosaic, as the state of conservation continued to cause problems with loss of tesserae, swelling and presence of soluble salts on the surface.

During the summer, an intervention took place from July to September to stabilize mainly the obvious detachments and consolidation of mosaic stone. In addition to this, the great work of documentation has to be mentioned, with a series of mapping on the state of facts and intervention performed: 1-Area Need consolidating injections, 2-Gaps & detached tesserae, 3-Efflorescence of salt, 4-Injection of mortar & primal, 5-Consolidation with ethyl silicate & paraloid, 6-Detachment after the intervention of consolidation. These documents are a precious material to keep the mosaic under control and to understand its degradation process.

Intervention of conservation:

1. General cleaning and removal of all inconsistent materials on the surface of the mosaic
2. Consolidation mosaic with lime base mortar and acrylic resin Primal AC 33 at 10%
3. Injection of Liquid lime base Mortar and / or Primal AC 33 to 10%
4. Strappo of two small pieces of mosaic, consolidation of the preparatory layer and re-adhesion the mosaic with lime based mortar.
5. Washing and removing soluble salt on the surface of the mosaic

6. Consolidation of the most degraded tesserae with Silicate Silicate at 75% in White Spirit

7. Consolidation of glass tesserae with Paraloid B 72 at 5% in Tinnar

Team of Work: Franco Sciorilli, Mohammed Nihad Ebraheem, Naif Zaban, Hussein Hamad and Mohammed Nuweija.

In 2011, at the request of the Director of ACOR Dr. Barbara Porter, it is decided to make a general check on the state of conservation, and comparing the current state with the one in 2004, there is a worrying process of degradation, with loss of tesserae and detachments of large dimensions. This situation has placed us in the need to study and understand in detail what were the main causes of degradation. After an on-site inspection, the situation seemed clearer, the fire that had destroyed the church at the beginning of the 7th century was focused on the entrance area, and it is precisely here that the greatest degradation has been detected, the fire had damaged the preparatory layers in an irreparable manner, and this is what led to the loss of tesserae and detachments. The restoring master Antonino Vaccalluzzo was informed in detail of our inspection and surveys carried out, and after an exchange of views we have formulated two hypotheses of intervention:

1. Mortar injections and acrylic resin to stabilize the swelling and detachment.
2. The strappo of the mosaic adjacent to the entrance of the two aisles, the left one for about 18 square meters and the right one for about 14 square meters.

The first proposal could only give a limited result over time, with the need to set up a monitoring and intervention plan for subsequent years, while the strappo and repositioning, after careful consolidation of the preparation layers, gave more breath and increased durability over time. After several consultations, between specialists and ACOR's leadership, we took the decision to intervene with the strappo of mosaic, and on October 15 we started conservative intervention that lasted until December 2012. This work was divided into four intervention campaigns, from 15 October to 17 November 2011, 20 January to 10 March 2012, 5 April to 31 May and 18 to 27 December 2012. After 10 months, on October 11 and 12, 2013, a monitoring has been done to control the state of

conservation, and to verify the good performance of the conservative intervention done. After a careful check and some small intervention of re-adhesion of a few tesserae, it was possible to note that the intervention had given the hoped results, and today at a distance of almost five years we can say that conditions of the mosaic can be considered good.

Even during this intervention, a lot of documentation work has been done, which led to the drafting of various mappings: Strappo of the Mosaic, Soluble salt, Detachment and swelling of the mosaic.

Intervention of conservation:

1. General cleaning and removal of all inconsistent materials on the surface of the mosaic
2. Individualization of the area of the mosaic to be done the Strappo (lifting)
3. Gluing with gauze and vinyl glue, on the fragile zones of the mosaic
4. Gluing of 2 layers of cloth in cotton with vinyl glue
5. Numeration of the sections and lines of union
6. Individualization of the levels of the mosaic, with that the mosaic can be fixed back more possible next to the original position
7. Strappo of the single section.
8. Removal and cleaning of the mortar remained in contact with the tesserae, by mechanical action, with chisels, hammer, scalpel and electrical machine.
9. Removal of the old mortar on the back of the mosaic, mainly the inconsistent one
10. Realization of the new bed for the mosaic with new lime base mortar
11. Fixing back of the mosaic with fine lime base mortar
12. Removal of the two layers of cloth and the gauze on the surface of the mosaic
13. Washing and removal of the residual glue
14. Consolidation of the swellings and detachments of the mosaic with liquid lime base mortar and Primal to 7,5%
15. Consolidation of the swellings and detachments of the mosaic with Primal to 7,5%, by Drip

16. Selective consolidation of the mosaics with Syton X 30, first layer to 15% and the second layer to 7,5% in distilled water.
17. Closing of the gaps with lime base mortar
18. Washings and removal of the soluble Salts that have appeared in surface of the mosaic.

Team of Work: Antonino Vaccalluzzo, Franco Sciorilli, Mohammed Freij, Mohammed Al Jamaliyya, Hidar Al Abbadi, Khaled Mohammad Ali Alwahkyan, Hamza Alwahkyan, Marwan Al Jamaliyya, Taher Alwahkyan, Naif Zaban.

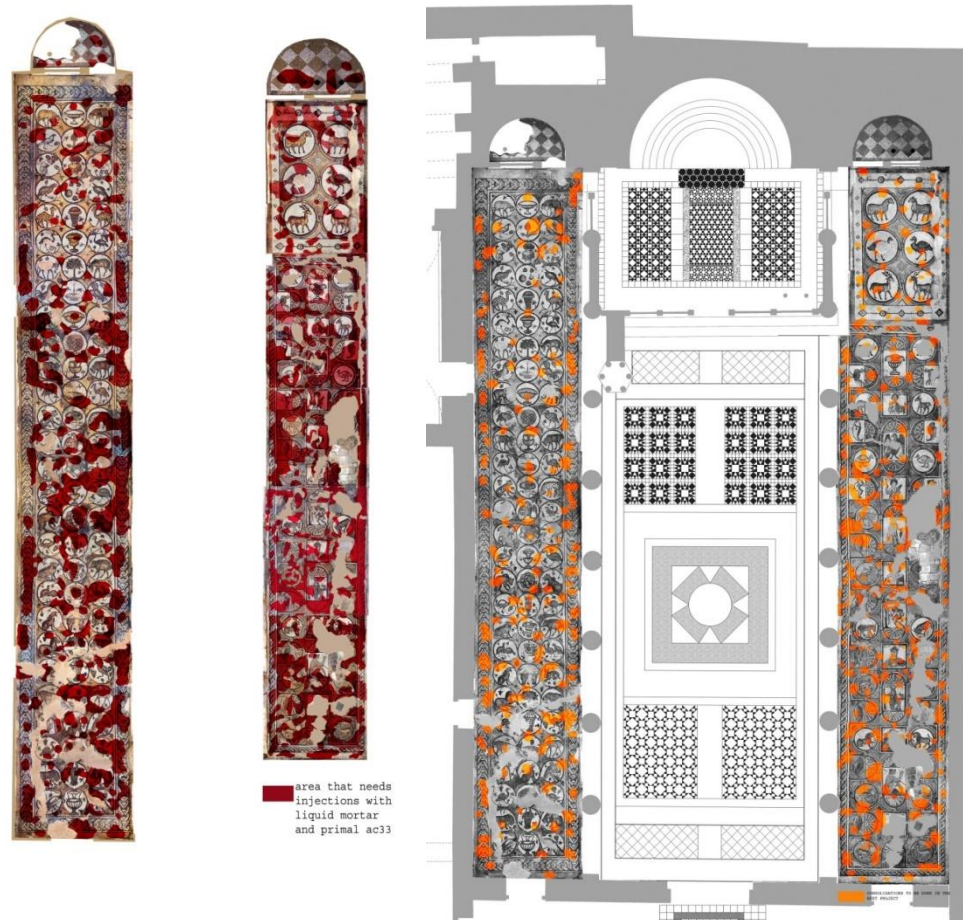


Figure1 Maps of the state of conservation of 2004

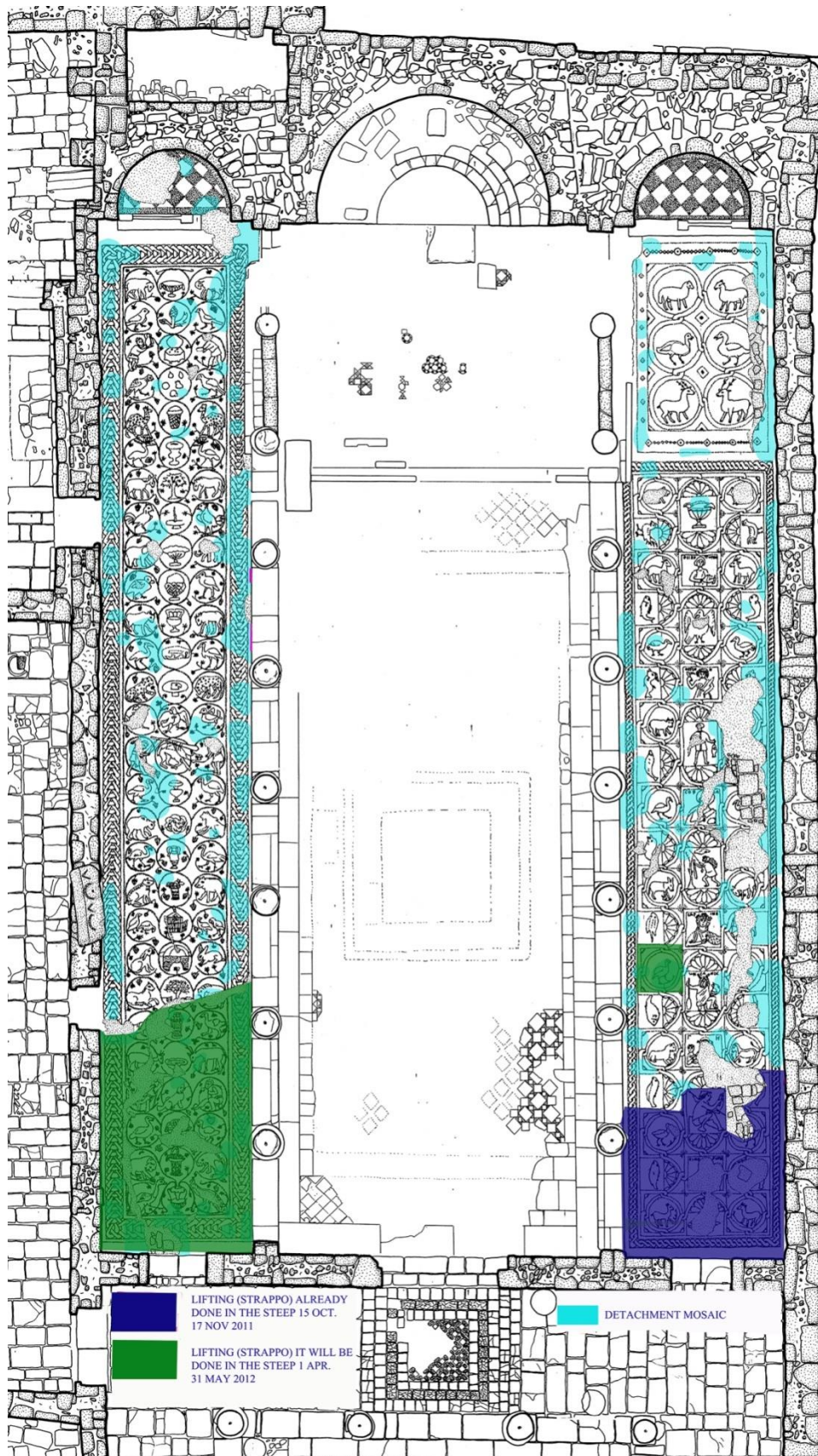


Figure2 Map of the state of conservation 2012



Figure3 Documentation



Figure4 Consolidation and Pre-consolidatio



Figure5 Mosaic levels points



Figure6 Mosaic levels Point

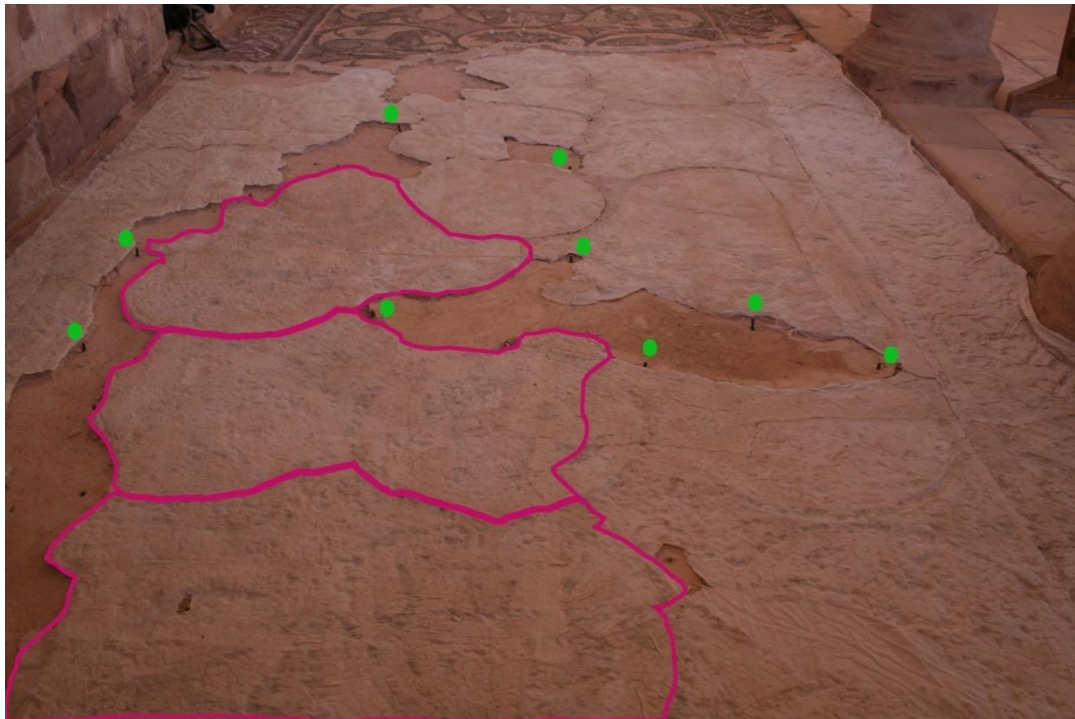


Figure7 Levels Points and sections for the Lifting of the Mosaic



Figure8Lifting a section of Mosaic

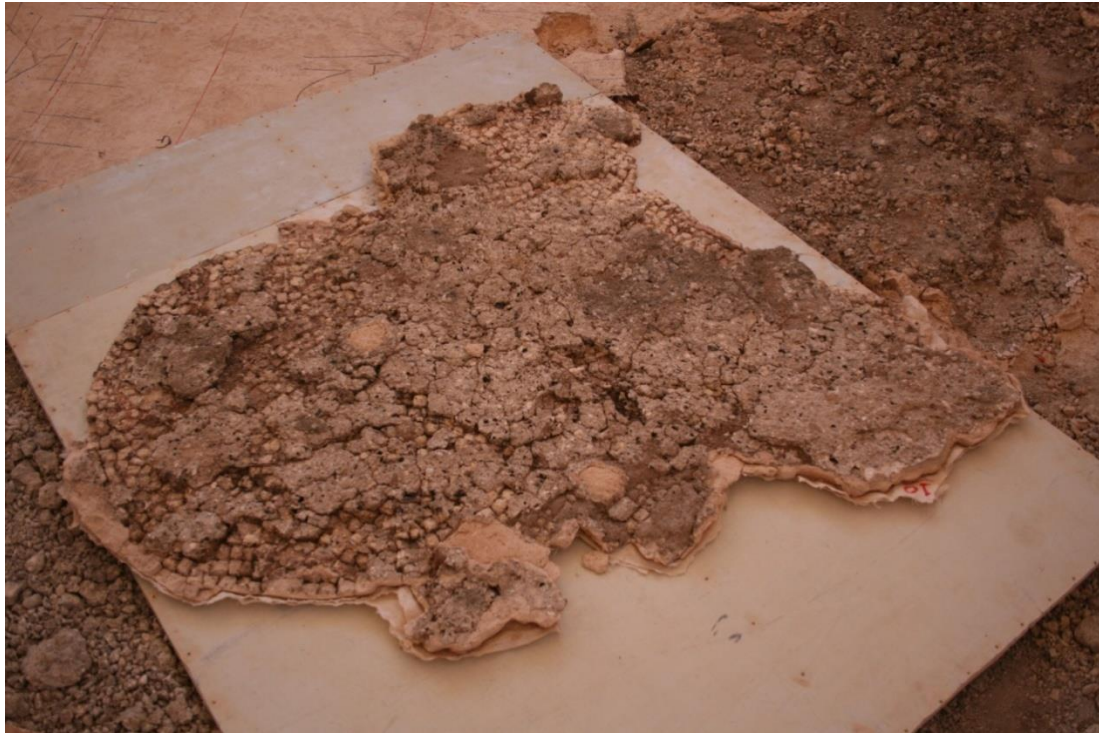


Figure9 *Reverse of the detached section*



Figure10 *Reposition on new bedding layer*



Figure11 *Reposition of the individual Tesserae*



Figure12 *Final protection with Paraloid B 72*

TRAVELLERS OF 1857 TO PETRA

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Abstract

Following Burchhardt's visit in 1812, Petra became a magnet for adventurous western travellers in the Middle East. The two catalogues of these travellers during the next century seem modest – relatively few people and sometimes none at all in some years. A closer inspection reveals far larger numbers which may help to explain some of the hostility they faced. More than that, the numbers and the cultural and economic impact was considerable and the effect on the tribes engaged in transport and guidance and those who inhabited Petra and its environs was bound to introduce friction and inter-tribal upheavals. The paper will explore a few randomly chosen years to determine the scale of visiting and composition of the parties then consider their reception and the impact of so many alien intruders, evidently wealthy and including some women. Their motives were surely the pursuit of treasure, and their practices were suspect – drawing, measuring, writing notes and later taking photographs.



Jabal Harun – the Tomb of Aaron above Petra and the Christian church nearby

For a century after Burckhardt's visit in 1812, Petra was a magnet for adventurous western travellers in the Middle East. Nevertheless, the two catalogues of known travellers – by Brünnow and von Domaszewski (1904) and Lewis (2004), seem modest – relatively few people and sometimes none at all in some years. Thanks to the digitisation of old books and of unpublished archives, much more is now known and a close inspection and some detective work reveal far larger numbers than previously suspected. The large numbers may help to explain some of the hostility travellers faced. More than just numbers, the cultural and economic impact was considerable and the effect on the tribes engaged in transport and guidance and those who inhabited Petra and its environs was bound to introduce friction and inter-tribal upheavals. This paper will explore a randomly chosen year to illuminate the scale of visiting and the composition of the parties, then consider their reception and the impact of so many alien intruders, evidently wealthy and including some women. As viewed by the inhabitants, their motives were surely the pursuit of treasure, and their practices were suspect – drawing, measuring, writing notes and later taking photographs. Interestingly, part of the explanation for friction was 'communication' those few who spoke Arabic and could explain themselves in person, tended to experience fewer, problems.

I. TRAVELLING TO PETRA

Introduction

Petra, O Leeds, is the most wonderful place in the world, I have read hosts of the most beautifully written accounts of it, and they give one no idea of it at all ... so you will never know what Petra is like, unless you come out here... Only be assured that till you have seen it you have not had the glimmering of an idea how beautiful a place can be. (Letter of T. E. Lawrence to E. T. Leeds, February 1914).

When the 28 year old Swiss orientalist and explorer, Johann Burckhardt rediscovered Petra for the West in 1812, he did so in disguise and claiming only to be making an offering at the tomb of Aaron on Jabal Harun. By 1914 when Lawrence visited, it remained a still distant but relatively easy place to reach for over 20 years; some travellers could even use the Hedjaz Railway which passed

through Ma'an, 20 miles to the east. Within a few more years it could be reached by automobile and was being flown over.

Between 1812 and the 1890s, however, access had been immensely challenging, hard on bodies and health; the hardships could be fatal. For the conservative communities of the region, too, the sudden irruption into their previously remote lands by wealthy westerners – including some women, was a startling novelty. The impact of a new source of money for notoriously impoverished people could be a benefit – and a curse. The lure of Petra, however, was strong and for a century after 1812, Beduin and *fellahin* alike were progressively exposed to influences that brought change.

Just how common western visitors were is clear only in outline but there is abundant and increasingly accessible evidence to provide detail. A decade ago, one would have guessed at a few hundred people between 1812 and 1914; now we need to think of much larger numbers with all that implies in terms of impact on society and economy. A close examination of a single year illustrates many aspects of this story: the relatively large numbers of westerners now being revealed through the wonders of the internet and digitization and their varied ethnicities, backgrounds and motivation; the growing restiveness of the Arabs in the face of this influx and the conflict that aroused; and consequences.

Travelling to Petra

The most popular route to Petra was advised in 'Murray', a handbook explicitly named and carried by many western travellers as their guide and authored by Rev. J. L. Porter, an authority on 'Syria'. It was published for the first time as, *A Handbook For Travellers in Syria and Palestine; Including An Account of the Geography, History, Antiquities, and Inhabitants of These Countries, the Peninsula of Sinai, Edom, and the Syrian Desert; With Detailed Descriptions of Jerusalem, Petra, Damascus, and Palmyra* (1858). (Further editions followed in later decades).

Travellers met in Cairo, formed a party, interviewed and hired a dragoman who would act as guide, interpreter and Mr Fixit to arrange transport, equipment and beduin escorts/ guides. They then drew up a formal contract and had it witnessed by the Consul of their home country if one was available. Many had

previously sailed on the Nile for two or more months and were acclimatized to some extent and had acquired some familiarity with 'the East'. What was to follow, however, was of a very different character and far more demanding and dangerous.

On the appointed day they set off on camel for Suez, then across the Sinai Desert to St Catherine's Monastery, and onwards to Aqaba on the Red Sea. There they parted from their Sinaitic Beduin escort and had to negotiate with the 'Alawin tribe which dominated the region between the northern Hedjaz and Edom. The latter were invariably much harder bargainers but travellers by then had no alternatives – they could proceed with the 'Alawin on their terms to Petra and Hebron or stay with their Sinaitic Beduin and go direct to Hebron. Most swallowed their pride and paid up and complained bitterly afterwards.

This Long Desert Route from Cairo to Hebron lasted about 40 days including halts. Few travellers had ridden camels before and even in the mild weather of the January to May 'season' they could encounter extreme conditions of rain, cold, storms, dust and unexpected heat. Most travellers adopted at least some 'Turkish' clothing and men often finished the trip in near-ragged costume and with 6 weeks beard. Published accounts often describe the logistics of tents, beds and meals, which emphasized the massive undertaking involved.



The Travellers – ‘Howadji’

The first visitors were explorers. Burckhardt in 1812 epitomised the breed – a man who had intended to explore Nubia, but diverted to Syria, learnt Arabic and re-discovered Petra. Of the five men who were there in 1818, Irby and Mangles were officers in the Royal Navy, Finati, Buckingham, Bankes and Legh were all seasoned travellers in the East.

The publication of Laborde’s wonderfully illustrated *Voyage de l’Arabie Pétrée*, in 1830 gave a tremendous impetus to visiting and most subsequent visitors were increasingly motivated by what may be called adventure tourism. It was never to be easy to reach and explore Petra until the later 1890s but it could be done and after 1835 it was a rare year that did not see at least one party of Howadji - ‘Travellers’.

| Year | Traveller(s) |
|------|--|
| 1812 | Burckhardt |
| 1818 | Irby, Mangles, Legh, Bankes, Finati |
| 1826 | Strangways, Anson |
| 1828 | De Laborde, Linant de Bellfons, Petitjean |
| 1835 | Chambers, Michel |
| 1836 | Stephens, Rowley, Rowley, Ker Seymer, Conway, Moore |
| 1837 | Schubert, Lindsay, Estridge, Beek |
| 1838 | Robinson, de Bertou, Carden, Prudhoe |
| 1839 | Kinnear, Roberts, Littleton |
| 1840 | Layard, Morris, Koller, Olin, Formby, Arago, Ditmas, Ditmas, Weir, Wheeler |
| 1841 | |
| 1842 | Castlereagh, Ward, van Rensselaer, Millard, Measor, Plumley, |
| 1843 | Wilson, Caulfield, Denny, Durbin |
| 1844 | Bininger, Cooley, Cooley, Sears, Schmidt, Pourtalès, Keith |
| 1845 | Bartlett, Tassel |
| 1846 | |
| 1847 | Martineau |
| 1848 | ‘RWG’ |

| | |
|------|----------------------------------|
| 1849 | Dieterici, Churchill, A. L. ..., |
| 1850 | Bridgeman, Hindley |
| 1851 | Marsh, Warre, Lowth, Finn |
| 1852 | Hanbury, Smith |
| 1853 | Stanley, Maxwell, Maxwell |
| 1854 | Ross, Rodewald |
| 1855 | Frazer |
| 1856 | |
| 1857 | Roth |
| 1858 | Lear, Bourassé? |
| 1859 | |
| 1860 | |
| 1861 | O'Brien |
| 1862 | Ehni, Bosworth, Stuart-Glennie |
| 1863 | |
| 1864 | De Luynes |
| 1865 | Visconti, Miles, Smith (2), 'P' |
| 1866 | |
| 1867 | Fortnum (2) and Keats |

Table 1: Travellers to Petra 1812-1867 (after Brünnow and von Domaszewski 1904: 192-4 and Lewis 2004b). This is not a complete tally of individuals but only of named parties or individuals recorded in graffiti or otherwise known to these two sources.

Travellers were overwhelmingly men but in 1836, John Lloyd Stephens - the first American, was followed weeks later by Charlotte Rowley, the first western woman. Many were European aristocrats – Lord Lindsay (1837), Lord Prudhoe (1838), Comte de Bertou (1838), Baron Koller (1840), Viscount Castlereagh (1842), Duc de Luynes, the Marchioness of Ely,

Several were artists – David Roberts (1839), Edward Lear (1858), Frederic Church (1868) and Jean-Léon Gérôme (1868), while Viscount Castlereagh, in an age before photography, hired the artist, Anton Schranz the Younger, to record the sights.



Petra – looking west along the Colonnaded Street. Visitors often camped on the level ground just right of centre

Many were clergyman, especially Scottish and American Presbyterians: The very austere Alexander Keith (1844) whose book *Evidence of the Truth of the Christian Religion derived from the Literal Fulfilment of Prophecy* went through at least 40 editions between 1823 and 1873; Dean Arthur Stanley (1853); and most famously, Dean William Burgon (1862), whose prize-winning poem about “A rose-red city, half as old as Time”, had been written 17 years before he visited Petra.

Some were ‘scientists’ in the widest sense – Gotthilf von Schubert (1837) led a party of experts in various fields, including another artist - Johann Martin Bernatz; Kitchener, Hull and Hart (1883) and the great archaeologists Musil (1896, 1898), Lagrange (1896) and Brünnow and von Domszewski (1897, 1898), all visited with ‘scientific’ purposes in mind, from mapping through botany to archaeology.

After 1844 photographers appeared and cameras soon became common accessories – George Keith (1844), Henry Leavitt Hunt and Nathan Flint Baker (1852) and John Shaw Smith (1852).

Then there were the celebrities such as the social reformer Harriet Martineau (1847), the archaeologist of Troy and Mycenae, Heinrich Schliemann (1850) and – on the eve of the First World War, the future Lawrence of Arabia (1914).

Travellers of 1857

According to ‘Murray’ (1858: 1, 41):

During the spring of the present year [1857] travellers have encountered more than usual difficulty in their visits to Petra. It appears that the 'Alawin were engaged in some war in the interior of the desert, and could not be got to 'Akabah to form an escort. The Fellahintoo, who inhabit the defiles of Wady Musa, showed an insolence and a rapacity far beyond even all former experience. ... no party, I believe, was permitted to remain more than about 24 hrs amid the ruins, and during that time they were exposed to every species of outrage and violence. ... and one large party, ... were deliberately fired upon in their tent, and had a servant dangerously wounded.

Plainly there *were* visitors at Petra in 1857 including ‘one large party’, but the two listings of visitors published in 1904 and 2004 (Brünow and von Domaszewski 1904; Lewis 2004), knew of just the one party, represented by a single individual, Rudolph Roth. The marvels of the worldwide web and of search engines and the wholesale digitization of libraries and archives of unpublished documents including contemporary journals, have transformed the situation. It is clear now that at least 15 discrete parties were there during the ‘season’ of 1857, comprising not one but at least 57 people including five women. Much of what is known about them comes from unpublished journals but much, too, from access now to long-defunct newspapers and magazines containing reports and accounts. The experiences that can be reconstructed of a few of these provides a marvellous insight into the nature of this great adventure, the people involved and what subsequently became of them following lives in which Petra will have seemed an increasingly distant and almost surreal experience.

II. THE TRAVELLERS

The Joseph Party, 2-3 January 1857

The *Jewish Chronicle* of 1857 reports the experience of three Americans at Petra

and the serious attack made upon them. Two of these - Hyam Joseph of San Francisco and James Augustus Lehman of Philadelphia are the first western Jews known to have visited. The third member was Dr James Bernard P(eale?) Hank of Philadelphia. A medical graduate of what is now George Washington University in Washington DC, Hank arrived from Russia where he had been one of about 30 American doctors who had served on the Russian side in the Crimean War (1853-6). At Petra, the Joseph Party was met by considerable direct violence. Hank was struck on the knee by a musket ball though without hurt, then another struck him on the breast causing bruising. A further ball penetrated the cheek of their German waiter, dislodged a tooth and fell out of his mouth. The serious injury was to their Greek cook. Shot in the hip, he was severely injured and when the entire party fled Petra they left him behind. As the beduin and fellahin were notoriously short of gunpowder, we can infer their muskets were not fully charged and probably never intended to cause fatal injury. The published account was headed (*Jewish Chronicle*, Feb. 13 [1857]):

Dangers of a Pilgrimage to Jerusalem.

AMERICAN TRAVELLERS ATTACKED BY BEDOUINS – A PALAVER AND A FIGHT – THE DEFENCE AND ESCAPE.

ALEXANDRIA, EGYPT, Jan. 23, 1857.

Accounts of this attack became well-known and are certainly what 'Murray' refers to (above). They arrived in Hebron on 9 January 1857 and are probably the 'Petra Party' referred to twice by Herman Melville, the author of *Moby Dick* who had toured Egypt in 1856 and then sailed to Palestine. Arriving in Jaffa in January 1857, his brief diary records:

Jan 20th

.... Found the Petra Party at Jaffa.

Jan 22nd

Mr Cunningham & the Petra party left this afternoon in the French steamer for Alexandria.

Their newspaper report is dated 'Alexandria, Egypt, Jan. 23, 1857', the date the steamer would have arrived from Jaffa.

Although young, Hank died quite soon after his return. The *New York Daily Tribune* for June 29, 1859 carried this obituary:

Dr. J. B. P. Hank, a professor in the Morgantown (Va) Female Seminary died on the 16th inst. He was a native of Harrisonburg, VA and during the Crimean War served as a surgeon in the Russian Army, making a tour of Palestine and Egypt at the end of the war. He was only 29 years of age.

The Lunt Party, 2-4 April 1857

In 1865, the Italian traveller Giovanni Visconti passed through Aqaba en route to Petra and recorded in his 'Diario' (1872; cf. Lacerenza 1996):

Close to our tents, planted over a mound of scrap metal and sand, a stone of about 20 cm, broken and placed sideways marks the grave of a stranger.

W. PLUNT (sic)

USA

1857

It is the grave of an American who died of dysentery at Aqabah.

He is in fact William Parsons Lunt, Harvard class of 1823 and a renowned Massachusetts clergyman. Other brief reports in various places record the circumstances of his death at Aqaba.

Having become ill crossing Sinai, Lunt died a month before his 52nd birthday – old to be undertaking an extremely demanding journey. A few months later, a colleague in Boston included in a memorial volume a printed account of the death as sent by his two travelling companions who signed themselves as 'W. Schoolbred, Theological Student' and 'B. Hinshaw' (Bausman 1861: 171; cf. Ranks 1912). After his death, from amongst all the Howadji then at Aqaba, three Englishmen - two lawyers and a clergyman, were deputed to examine Lunt's baggage, record the valuables found and transmit them to the American Consul for sending home. Lunt's companions rolled his body in his mattress for immediate burial and another American clergyman, conducted a service for him.

Regarding Lunt's two companions, in one report we are told he "... travelled with a young Scotchman and his tutor" and the same report later refers to "the faithful Scotchman nursing him as best he could. Just before

he died, he pressed the hand of his friend and begged him not to desert him, as he would die soon”.

The ‘Scotchman’ is almost certainly Williamson Shoolbred of Dunfermline in Fife. He had been in business before studying at Edinburgh University, was ordained as a minister shortly after this eastern adventure, spent much of his life as a Presbyterian missionary in India and in 1888 was elected Moderator of the Church of Scotland. In 1857 he was 30.

The final word on the Rev. Lunt is again from Visconti who was there eight years after Lunt’s death (1872: 313):

[People at Aqaba] said that the relatives came a few years ago to look for the body to take him to America, but as far as they dug they found nothing.

The ‘Bolen’ Party, 22-23 April 1857

The Reverend Bolen – or it may be Boland, was travelling with his wife and had been very ill at Aqaba. He recovered enough to proceed with the rest of the group and did reach Petra but was evidently too ill to explore the site. Their onward journey was to end tragically. On 26th April, while still on the way to Hebron, one of the Americans recorded in his unpublished account (Robertson 1857: MSS 184-6) – original spelling:

As we were sitting down to dinner, about two hours after we had encamped, our dragoman came in and announced to us the melancholy tidings that our friend Bolen was dead, although it was not so unexpected to me, but I never dreamt of its terminating so suddenly, to think that two [hours] before he was riding on his dromedary and that now he was a corpse. It was impossible for me to realize it. It is sad enough at home for a wife to be bereft of a loving husband but, in this terrible wilderness, so far from friends and surrounded only by strangers, his poor wife had witness his last moments on earth. She was left entirely alone except by the party with whom they had fallen in at ‘Akabah’ but the gentlemen seem very attentive and kind to her affliction. His disease was at first a severe attack of pluresy which ended in Typhus fever, ...

On Monday 27th April 1857:

As it would be impossible for us to Interre the body of our friend here with any idea of its remaining in the ground on account of the Hyenas, we thought it better to

dispatch it immediatly to Jerusalem. One of the gentleman volentering to accompany it, we laid it out a(nd) fastened it to a camel ...

The death is recorded in other unpublished accounts, one of which notes that Bolen had been met some months before (ref):

In the evening we overtook Mr Bolens's party (the sick man) As soon as I saw him I recognised him as the man who sat opposite us at table in Rome, and remembered the sneers against Americans he took pains to utter

The Coleman Party, 22-23 April 1857

A party of ten Americans came together at Cairo in an agreement to take the Long Desert Route via Aqaba and Petra to Jerusalem. Some had travelled together previously in Europe and Egypt. The party consisted of three sub-parties – an original five (A), joined but a further four (B) and then at the last moment by an individual (C):

A. Dr Lyman Coleman (1796-1882), **Augustus Graham Coleman** (nephew of the preceding) (1836-1888), Samuel Richards Colwell (c. 1835 -), **Archibald McI(ntyre?) Robertson** (c. 1835? -) and Daniel Giraud Elliot (1835 - 1915).

B. Carleton Gates (c. 1831-1869), Chauncey Hawley (b.1830?), **Richard James Oglesby**(1824 –1899) and Dr Lewis Holmes (b. c. 1835)

C. **Frederick Hubbard** (1817–1895)

The journals of four of them survive (in bold above), three of them available in their unpublished form, the fourth (Hubbard) prepared for the press but not published until almost a century and half later in 2010-12.

The Coleman caravan consisted the ten Americans, a Dragoman and four servants and 35 camels. Of the six tents, four were for sleeping, another was a very large saloon tent and the sixth was for a kitchen. Two of the travellers explicitly remarked on the luxurious style in which they were to eat.

Dr Lyman Coleman is the well-known clergyman and author of several books on the Holy Land, not least an historical geography and an atlas published in 1849 and 1854 respectively (refs). On several occasions, his companions record being approached by other American travellers enquiring if they are part of the celebrated Coleman party. His expertise had led to it being agreed that the other

nine members of the party would pay his share of the costs. In April 1857 he was nearing 61, easily the oldest member of the party, had had ailments and injuries already from as early as the Atlantic crossing, was to suffer a great deal from the hardship of the journey and was to become very ill in Syria. Opinions on him vary. Some resented his insistence on keeping the Sabbath until at least 3 pm; three refused when they reached Jerusalem to pay their share of his expenses; and his nephew Augustus observed that the only time he had interesting adventures was when there was no one else there to corroborate them While still in Italy, Robertson painted a picture of someone he called “a good old man but a veritable yankee in every sence (sic) of the word” (ref). He behaved arrogantly and had the austere Protestant’s contempt for Catholic Church ritual - “he has no respect for the forms of the country nor the Church and will turn his back to the alter and will read Murray out aloud during the elevation of the host” (ref). On the other hand, when Oglesby – who had shared a tent with him across the desert, last saw him in Damascus and believed him on his death-bed, he wrote in his own journal (Oglesby 1857: pdf 376 (532)):

We returned to the hotel and in the evening called on Mr. Frazier, to take a final (indeed I fear a final) leave of our old friend and very highly respected fellow traveller, Dr. Coleman. He is distressingly reduced from an attack of dysentery, now nearly chronic, and although he has courage and ambition to make a successful Chief, these cannot forever fortify him, but must at last yield to the demands of the grave. Our interview was long and pleasant, but my heart ached when I took his warm hand for the last farewell. “If,” said he, “you ever come to Philadelphia, or wherever my home may be, and I am not there, be sure that you go to see my family, but if I am, be sure you come to see me, for I would be pained if you did not.” Yes, Dr. we have slept forty nights together in one tent on the deserts of Arabia, and we shall be good friends for ever, visiting each other at all times when it is possible.

He recovered and lived a further 25 years – and surely followed with interest the career of his tent-companion, Oglesby.

A curiosity – given Coleman’s interest, is that the ‘New and revised edition’ of his *Historical Geography* of 1868 shows no change in regards to what he had written of Petra from second-hand reports in his edition of 1854.

Two other members of the party were to become famous. The wealthy Daniel

Giraud Elliot, just 22 when they set off, was engaged on an immense foreign tour for health reasons. He was soon to emerge as an expert in ornithology and became a founder of the American Museum of Natural History in New York and Curator of Zoology at the Field Museum in Chicago.

Richard James Oglesby – aged 32, was already a colourful character – a westerner (Kentucky and Illinois), adventurer (fought in 1846-7 in the American Mexican War and then made a fortune in the California Gold Rush of 1849) (Plummer 2001). He subsequently trained as a lawyer and in later years served three times as governor of Illinois, as an Illinois state senator, as a Union general in the Civil War where he was seriously wounded and as a US Senator. He played key roles in Lincoln's career, conjuring up the common-man image of Lincoln the 'rail-splitter'. He was at Lincoln's deathbed and accompanied the corpse home to Illinois where he gave one of the eulogies. Appropriately, the typescript of his journal is archived in the Lincoln Presidential Library in Springfield.

Robertson evidently liked him, describing him as "a perfect brick"; perhaps almost literally as he adds that he weighs "in the neighborhood of 212 pounds" [95 kg]. In his own (unpublished) journal Oglesby emerges as thoughtful and mature. As one might expect from his military adventures and later career, he was also a robust character. In his journal he reports what he admits was a silly affair before joining the Petra trip, in which he and Hawley had been involved in a nearly murderous fight inside a tomb in Egypt and had had to be separated by their guide.

Oglesby reports conflict in the group involving the bullying conduct of Gates.

I regret to say a difficulty which nearly became serious, marred the joy of the camp until a late hour: Mr. Gates who has been petulantly displeased with our dragoman, Ali Agazee, came in to camp about 8 P. M. and swaggeringly attacked Ali with many threats and gymnastics about his saddle, indulging freely in inuendoes (sic) against the whole company, and finally taking the unresisting Arab by the collar swore he would boot him to the Holy Sepulchre: a meeting was called to review his [i.e. Gates's] conduct and if need be put him out of the company; he was sensibly brought to reason by the frank and manly address of Mr. Elliott (sic) who agreed to do all of Ali's fighting for the journey.

In the journal, Oglesby's widow inserted a note to the effect that she had been told by her husband that he had also reminded Gates "that only 1/10 th of Ali belonged to Mr. Gates, and that he must not touch the 9/10 ths of Ali belonging to the other men." Later, as they travelled between Aqaba and Petra (Oglesby 1857: 285):

It is a source of regret to me that in an interesting land like this a few disquiet and quarrelsome members of our company have it in their power, by petty complaints and fault-finding to render every peaceably disposed gentleman uncomfortable by constant and ridiculous folly. Not a day passes but two men find occasion to make us all regret we had ever met them. Both are from New York city and both are products of the Bowery.

This is Robertson writing about their split at Jerusalem:

Our noted company of 10 is no more, to day we have come to a grand separation, the facts are as follows. Gates, Holm(e)s & Hawley have from the start have been a "clique" of themselves and in many instances have not acted as gentlemen should have done. On this account, Elliot, Hubbard & Oglesby, determined to leave and engaged another Dragoman, and we, finding that the best of the party were leaving pursued the same plan ... In the afternoon we recd a letter from the "Gates Crowd" which in character was abusive and sharp, but to (=so?) carefully worded that it could not be made insulting, and for this reason we took no notice of it, not even answering it. The substance of the letter was that they had agreed among themselves that they would not pay the Drs. expences across the desert as they had promised to do because we had thus rudly separated ourselves from them, just at the time when they expected to receive the instruction they had been promised. This I think the smallest thing I ever heard off, and although it costs us 3 youths \$60 more then we had expected I would have paid 10 times the sum rather than remain with them. I might have expected such a proceeding from Gates & Hawley but from Dr. Holm(e)s of Baltimore I did expect more.

Carlton Gates – another medical graduate, was to become notorious. He died young in 1869, his death being followed by a lengthy court case brought by his parents to have his will invalidated on the grounds of his insanity. Their request was upheld.

Robertson was much more admiring of Augustus Graham Coleman, whom he

describes as “a young man 20 years of age, fully as one horse as the noble town from which he hails.” ‘Gus’ Coleman returned home to Canandaigua in up-state New York and became a pioneer and authority on early photography. His journal survives, revealing a likeable young man who enjoyed his food too much and put on a great deal of weight (Coleman 1856-7).

The final journal is that of Archibald McIntyre Robertson (c. 1835? -) (Robertson 1856-7). He is from Philadelphia where his father – a recent (?) Scottish immigrant, was in real estate and mining businesses. Little is known about him but he appears to be in his very early twenties, an interesting judge of character and, in writing to his mother, refers to himself light-heartedly as “Your only hope”.

It was a hope that very nearly ended in tragedy between Petra and Hebron (MSS 186):

... an accident of rather dangerous character happened to me, one which I am afraid will give me trouble during my trip. We had just commenced our meal when I arose to open a bottle of Porter, which as it had been heated during the day was very lively. As I had no corkscrew with me I picked up a sword and commenced knocking the neck off, at the first blow the bottle exploded with the report of a pistol sending it into a thousand fragment some of which were thrown 50 ft. a large portion was thrown against my face and cut a most terrible gash over 2 inches in length directly across my mouth, fortunately it was a little to the one side of the middle, it cut clear through both lips on to the gums. My first intimation that I had been struck was the blood runing (sic) down my throat as I cut a large vein, it bled most profusly (sic) but we managed to bind it up with cloths. It was a very fortunate escape for my eyes or my jugular.

... Dr. Holms dressed my wound which by this time was quite painful, nor was this lesned (sic) any by being sewed up, a most unpleasant opperation (sic) surely. It is amusing to see me eat as my mouth is all strap(p)ed shut, chewing is out of the question, soup and other fluids are the only things I can eat and these have to be sucked through a peice (sic) of Macaroni.

III. WAS IT WORTH IT?

Petra is a magical place. The location is stunning and even without the astonishing archaeological remains, would be a magnet for tourists. Before 1914, from amongst the many thousands who travelled to Palestine and/ or Egypt, relatively few people ever reached the site. From the outset it was common for visitors to be allowed just a day or two to visit, before the inhabitants drove them off. Hostility evidently did deter some visitors and for 1857 we have references in the unpublished journals to two further parties arriving at Aqaba – Lord John Scott and a party consisting of an Irishman, his wife and two daughters, neither of which may have reached Petra. Nevertheless, travellers kept coming and 1857, far from being a year with just one visitor, was surely one of the busiest.

Few can have truly understood the difficulties they were to encounter. At the least the journey would be immensely wearing on the body. Another American traveller just a few years earlier (1850) had been profoundly impressed by Petra but was clear in his views about the Desert Trip (Ward 1851: 217):

A trip across the desert is one of those things that every man ought to try once, if merely to cure him of all longing to try it again. ... and that riding a camel was about as amusing as being ridden on a rail, ...

The Coleman Party had been warned before they set off, by the American Consul in Alexandria (Coleman 2: Pdf 48 LH):

Said he, I was 4 days on the desert and you will never catch me there again, but if you want to be roasted to death in the Sun and frozen at night, your eyes almost put out, your faces and hands blistered, I advise you to go.

His opinion was dismissed by Dr Coleman: "... a very weak minded man, or ... had rooms to let in his upper story."

Despite the hardships and difficulties in 1857 and even two deaths, those who recorded their impressions were in no doubt. This is Archie Robertson (Robertson MSS 183):

... my visit to Petra will be one which I will never forget, I consider it the gem of the Desert. Without this I would have ... voted this whole trip a grand bore, but this I had looked forward to with anxious anticipation, I had all my life hea(r)d of this city of rock and considered it one of the most singular places now in existances (sic) ... and the magnificence of its excavated structures, would well compensate a man

for the fatigues and hardships of this tir(e)some desert. Nothing in all my life ... will in any wise compare with it.

The Future?

The century-long episode of western travellers investing time and money, enduring hardship and danger, and risking injury and death, in order to visit Petra is one of the better-documented activities for Howadji in the East as a whole. The regular intrusion of parties of westerners into this relatively remote and lawless region is noteworthy not just for the experiences of the travellers and the progressive revelation to scholarship of the marvelous archaeological remains and of the wider landscape. We should also consider the impact of western men (and some women) and of the injection of money into a fragile economy and delicate inter- and intra-tribal social structures.

Defining the tribes and sub-tribes encountered has long been problematic not least at Petra itself with discussion of the Bdul and Fellahin, 'the people of Petra', but also of the Alawin/ Howeitat, Jehalin, Tiyyarah and Towarah. Previous discussions regularly mined the published reports of western travellers but even a generation ago the total corpus was greater than utilized and are now far more easily accessed as a result of extensive digitization and access on the web (above). Now we have many further reports emerging in unpublished archives. Time now to re-visit these questions.

Finally and more specific to 1857, there is the possibility for analysis of the visit through the multiple eyes of one party – the Robertson Party. The journal of Robertson is utilized above but there is the prospect of exploring it more intensively and comparing and integrating that with the more extensive archive copies of the journals of at least two of his companions - Oglesby and Coleman ... and, perhaps, Colwell (above)?

| Group/ Party | Route to Petra | Dates Petra | Number | Comment |
|---------------------|---|-----------------|----------|---------|
| French Party | Jerusalem – Hebron – Petra – Hebron – | 1?-3 January | 2 | |

| | | | | |
|--|--|---------------------------------|---|---|
| | Jerusalem | | | |
| American Party | Jerusalem – Hebron – Petra – Hebron – Jerusalem | 2-3 January | 5-10? | <i>' ... one large party ...'</i> |
| English and American Group | - Aqaba – Petra - | 1-3 April | c. 12 (1F) | <i>'... about twelve English and Americans ...'</i> |
| Anonymous Group - <i>Anonymous English Party</i> - <i>Anonymous Party 1</i> - <i>Anonymous Party 2</i> - <i>Anonymous Party 3</i> | Cairo – Mt Sinai – Aqaba – Nakhl - Petra – Hebron - Jerusalem | 2-4 April | 21 (3F) 10 (1F))) 11 (2F)) | |
| Roth Group - <i>Roth Party</i> | Jerusalem - Hebron - Wadi el- 'Araba - Jabal Harun - Petra – Wadi e1-'Araba – 'Aqaba - Hebron - Jerusalem. | 19-20 April | 1 | |
| Robertson Group - <i>Robertson Party</i> - <i>English Party</i> - <i>Bolen Party</i> | Cairo – Mt Sinai – Aqaba – Petra – Hebron – Jerusalem | 22-23 April | 18 10 6 2 (1F) | |
| TOTAL | | | 57-62+ (3F) | |
| ?Lord John Scott Group? - <i>Lord John Scott Party</i> | Cairo – Mt Sinai – Aqaba – | Arrived at Aqaba 17 April | 5+ (3F) 1+ 4 (3F) | |

| | | | | |
|-----------------|-----------|------|----|--|
| - Irish Party | | | | |
| [?Plunt Party?] | - Aqaba - | 1857 | 3? | |

Table 1: Western visitors at Petra in 1857

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PETRA, BĪR MADHKŪR, AND THE INCENSE ROUTE INITIATIVE

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Abstract

This paper will examines the rural economy of Petra, both from an ancient and modern perspective. The focus of the paper will be on the archaeology of the Nabataeans in the hinterland of Petra as well as community engagement, cultural heritage, and sustainable tourism at Bīr Madhkūr, Wadi Araba.

I. Introduction

This paper provides a summary of research and fieldwork conducted since 2008 at Bīr Madhkūr, which lies in Wadi Araba, Jordan, in the hinterland of Petra (fig. 1). There are two aspects of the fieldwork that will be discussed. First is the research component of the project, which focuses on efforts to illuminate the economic history of ancient Petra from a rural perspective. Some basic questions framing this research include: 1) how did Petra evolve as a city between classical and late antiquity; and 2) what sort of social and economic relationships existed between the city and its hinterland. An important subsidiary question is that of how the Nabataeans evolved as a people in classical antiquity, as they transitioned from a less to a more sedentary existence, on which new evidence from Wadi Araba sheds some light. The second aspect of the fieldwork at Bīr Madhkūr involves work conducted there between 2015 and 2016 that dealt with regional, economic development and focused on community engagement and site rehabilitation for tourism. Part of this work addresses the issue of whether knowledge about the ancient economy might inform current economic practices in Wadi Araba with an eye toward sustainability.

Assessing the Ancient Economy: Research at Bīr Madhkūr

An important key to ongoing debates about the nature of the ancient economy in classical and late antiquity is our understanding of the economic relationship between cities and their hinterlands. And with few literary sources, we rely heavily on archaeological evidence to make any informed assessments. But this reliance has its drawbacks. Our understanding of the ancient economy, specifically the economic relationship between cities and their hinterlands, is limited (and in some respects biased), because archaeological exploration remains weighted in favor of urban contexts. Datasets from rural contexts are fewer and more sporadic, but no less significant (Kouki 2009; 2012; Smith 2010a). This means that a more comprehensive narrative of Petra's social and economic history remains to be achieved, and this situation will not change until the disparity in our data from rural and urban contexts lessens. The important point to remember is that ancient cities were nothing without their hinterlands, and vice-versa. They were inter-dependent.

We began this project at Bīr Madhkūr in 2008, in order to explore the central Wadi Araba in the hinterland of Petra and to situate this city in the framework of the ancient economy (Smith 2010b). The main objective remains to document, through survey and excavation, the archaeological landscape and natural environment of the central Wadi Araba and to examine the site of Bīr Madhkūr as a regional hub of socio-political, economic, and cultural activity between native and non-native peoples, particularly as it relates to the regional economy. In the Classical period, for example, Nabataean Arabs prospered as middle-men in the lucrative spice trade, especially along the famed Incense Route that passed through their kingdom to Mediterranean ports (Smith 2017). The Greeks sought to control this trade, but it was the Romans who eventually conquered the Nabataeans and annexed their kingdom in A.D. 106. By the fourth century, the Romans had built the fort at Bīr Madhkūr, where the soldiers (mostly non-natives) supervised a rich agricultural zone. Therein lived a native population of farmers and pastoralists, and through this territory foreign merchants crossed. Survey and excavations at and around Bīr Madhkūr, therefore, aim to illuminate many historical issues centered on the impact that foreign influence and occupation had on local economic, social, and cultural life in Arabia. This work

also aims define the nature of the ancient economy, in particular clarifying the relationships (e.g., social and economic) between cities and their hinterlands and the role of the international spice trade in shaping Petra's regional history.

This project builds upon prior work conducted at Bīr Madhkūr and in Wadi Araba. The author initially surveyed Bīr Madhkūr in 1994, when the site was explored as part of the Southeast Araba Archaeological Survey (SAAS), a component of the Roman Aqaba Project (Parker and Smith 2014; Smith 2014; Smith and Niemi 1994; Smith et al. 1997). The purpose of the SAAS was to assess economic activity in the hinterland of Roman Aila (Aqaba), and Bīr Madhkūr allowed us to assess the trade routes that emanated from Aila to the north. This move to Bīr Madhkūr in the north, therefore, was a natural extension of work conducted in the southeast Wadi Araba. Also, before the current project, intermittent work was conducted at Bīr Madhkūr between 1997 and 2007 (Perry 2007; Smith 2005a; 2005b).

When the current project at Bīr Madhkūr began in 2008 it combined an intensive, regional survey with limited excavations at sites of significance across a range of economic activities. The late Roman settlement at Bīr Madhkūr was clearly the focal point, as a clear hub of regional, economic and administrative activity. We concluded two seasons of excavations at Bīr Madhkūr, in 2008 and in 2010. We also examined regional sites such as the Nabataean caravan station, Khirbet Sufaysif, south of Wadi Musa, and a regional farmhouse just west of Bīr Madhkūr. This farmhouse was contemporary with the main occupation at Bīr Madhkūr in the late Roman and early Byzantine period. Best highlighting the range of economic activity in the region, however, is the survey data, which the excavation data has refined in terms of dating. Built upon several reconnaissance surveys conducted as early as 1994, we began our intensive survey of the Bīr Madhkūr region in 2009, with four subsequent seasons from 2011 to 2014 (Smith and Kay 2016).

The Excavations at Bīr Madhkūr

Bīr Madhkūr lies in the foothills of Wadi Araba in southern Jordan, an area of rich–yet virtually unexplored–cultural resources. The main feature at the site is the late Roman fort (fig. 2). There is also a bath building/caravanserai complex, a

civilian settlement west of the fort, cemeteries, and numerous other structures in outlying areas. The main source of water at Bīr Madhkūr is the well just north of the fort.

The present climate is characterized by hot summers and mild winters. During the summer months (June-September), the mean daily temperature can often exceed 40-42° C, whereas the mean daily temperature averages between 20-28° C during the winter months (November-March). Rainfall in the region is sparse, averaging between 50-100 mm annually, and infrequent, occurring only during the winter month. Meanwhile, there is a high potential evaporation of up to 5000 mm annually. The extremes of daily temperatures combined with the infrequent winter rainfall qualify Wadi Araba as a typical desert environment.

The site extends over an area of less than 3 hectares (less than 7.5 acres). Because the site is relatively small, and because the architectural remains, for the most part, are visible on the surface, excavation areas (A-H) were easily defined. Area A denotes the Roman fort, Area B the bath/caravanserai, and Area C the domestic complex. Areas D-H define ancillary structures or areas of prominent remains around the main features of the site. In 2008, Areas A, B, D, and H (farmhouse) were targeted for excavation. In 2010, excavation of Areas A and B continued, and our investigation of Area C began. In addition to our work at Bīr Madhkūr, in 2010, we also conducted soundings at Area M, a regional caravan station south of Bīr Madhkūr (Khirbet Sufaysif), which we resumed in 2013. This work was conducted largely in response to recent looting of the site, as documented during our 2009 survey.

Before summarizing the preliminary results of the excavations at Bīr Madhkūr, it is important to highlight the limited scope of the work actually conducted there. The 2008 field season, for example, served primarily as a study season to examine some logistical complications of working in this remote area. Most of issues were resolved when we returned to Bīr Madhkūr in 2010 with a much larger team. This proved to be the only full season of fieldwork at the site, and the results far exceeded expectations. In addition to a wealth of material culture, which included pottery, glass, metal objects, and bone, more than 700 coins were recovered—a staggering amount compared to other regional projects. The decision was then made to halt further excavation work at Bīr Madhkūr until the

material culture from 2010 could be processed. The benefit of this decision was that it allowed us to focus on the survey of the regional landscape (see below). Although the excavation of Bir Mahkur was limited (and more remains to be done at the site), evidence of the occupational history of the site did emerge. Across the site, in most every trench, a Nabataean presence was indicated by several coins and an abundance of pottery that dated to the first century B.C. or before the A.D. 106 annexation. However, in the areas excavated, no architectural remains were uncovered that correlated to a Nabataean occupation at the site, although there may be Nabataean structures on the hill north of the fort and east of the well. Whatever Nabataean structures may have existed at the site in the areas that we excavated (Areas A-C), these were clearly levelled by the army unit prior to the construction of the fort and other features at the site. Although no foundation inscription has been found, nearby parallels of other *quadrivurgias* in Wadi Araba (e.g., 'En Hazeva and Yotvata to the west, Gharandal to the south, and Qasr et-Tlah to the north) suggests a late third century date for the construction of the fort (Davies and Magness 2011; 2014; 2016; Cohen 1993a; 1993b; 1994; Cohen and Israel 1996; Smith 1997). Foundation inscriptions from Yotvata and Gharandal identify their foundations under Diocletian (Roll 1989; Darby and Darby 2015).

The foundation of the fort in the late third century A.D. was supported by the ceramic evidence and to a lesser extent by the coins recovered from our excavations. Beyond that, there was continuous occupation at the site throughout the fourth century A.D. and well into the fifth century when the site was eventually abandoned. Between the initial construction of the fort and its apparent abandonment in the fifth century, there seems to have been two destructive events, one of which was probably the A.D. 363 earthquake that destroyed not only Bīr Madhkūr but sites throughout the region. The other may have been an early fifth century earthquake. Finally, from the northwest corner tower, there was some evidence of reoccupation of the fort in the sixth or early seventh century A.D., but this appears to have been mostly transient and short-lived.

The Survey

The primary goal of the survey in the central Wadi Araba is to explore the east-central sector of Wadi Araba focusing on the site of Bīr Madhkūr, which served as a regional administrative center and economic hub in the hinterland of Petra through much of classical and late antiquity. Overall, the objectives of the survey are to record evidence of past human activity in the region and to examine the natural environment (inclusive of the hydrology, geology, geomorphology, climate, flora, and fauna), in order to set the cultural landscape in a more comprehensive ecological context. The survey continues to record evidence from all historic and prehistoric periods, although the project is focused on the classical and late antique period sites, and artifacts are collected only at historic period sites unless diagnostic pieces are found. Ultimately, the new data shed new light on the rural economy of Petra.

The new data should also answer the principal research questions posed by the project, by illuminating the complex relationship (both past and present) between humans and their environment, and how this relationship has changed over time, as well as how different population groups interacted in the valley in different periods.

The survey also complements the project's efforts to support sustainable economic development in Wadi Araba. Specifically, while efforts to develop the site of Bīr Madhkūr for tourism began as early as 2007 (see below), it was clear from the beginning that the impact of increased tourist activity in the region would be difficult to assess because of the general lack of exploration in this sector of Wadi Araba. The data being gathered by the survey, therefore, now gives the Department of Antiquities greater knowledge of the cultural environment so as to facilitate efforts to monitor and protect archaeological sites.

The study area for the survey extends ca. 20 km north from Bīr Madhkūr, just to the south of Wadi Fidan at Wadi Hamdan and Jebel el Malaqa ($30^{\circ}34'37.21''\text{N} / 35^{\circ}28'24.41''\text{E} = 3385330.28 \text{ m N} / 737201.93 \text{ m E}$), and ca. 20 km south to Wadi Huwwar ($30^{\circ}11'44.73''\text{N} / 35^{\circ}14'45.76''\text{E} = 3342609.57 \text{ m N} / 716226.92 \text{ m E}$), which is near Wadi Abu Barqa and the northern limit of the study area set by the Southeast Araba Archaeological Survey. The western survey limit is defined by the modern Araba highway, although, when permitted, survey coverage extends

farther westward. To the east, within the foothills of the esh-Shera range, survey coverage extends several kilometers, with limits generally set by the local topography.

The overall survey objectives were broadly defined above. In terms of understanding the economic interrelationships between this vast study area and the city of Petra, more targeted aims are: (1) to document all agricultural installations in the study area, which include field walls, terraces, water channels, reservoirs, and farmhouses, in order to assess possible periods of habitation and exploitation, and to evaluate ancient patterns of use; (2) to document all evidence of nomadic or semi-nomadic activity in the study area, in particular campsites and epigraphic remains; (3) to examine the natural environment (hydrology, geology, geomorphology, climate, flora, and fauna) in relation to the cultural environment; and (4) to examine in detail the regional communication networks (namely, the ancient road systems of Wadi Araba), in order to assess the multifarious nature of the various pathways, roadways, and highways through the valley—the ancient Incense Road, in particular.

The survey methodology varies depending on the terrain. The project has divided the study area into discrete geographical zones based on the range of distinct geophysical features that characterize the central Araba. These include alluvial fans and alluvial plains, sand dunes and sand fields, ridges and mountainous zones, and wadi floors and wadi terraces. In each of these areas, based on analyses of aerial photographs at a scale of 1:10,000 (Series IGN-78-JOR-12/100), the identification of relevant features in the aerials guides the survey toward on-site verification of archaeological remains—satellite imagery at 0.50 m resolution is also used to supplement the aerials. Generally, however, in most areas where it is feasible, the survey employs pedestrian transects spaced 10-20 meters apart, which generally permits the identification of most sites in the study area, including the less obtrusive ones (e.g., sherds scatters or small campsites). Ultimately, the intensity of survey in any given zone varies. And finally, once a site is encountered, the survey team carries out a thorough and methodical recording process.

The area surveyed so far extends a few kilometers north and south of Bīr Madhkūr, between Wadi Gunnay and Wadi Musa. At the moment, we have

recorded a total of 1444 sites, the majority of which are small and unobtrusive, such as stone circles, stone rings, graves, and artifact scatters (fig. 3). We have also recorded larger sites, which include farmhouses, towers, and road stations. We have focused much attention on documenting the agricultural activity in the region as well as the various land-routes. Again, this focus on land-routes is important since one of our goals is to establish networks of connectivity between the various sites documented in the region to one another and, ultimately, to Petra itself.

While we are recording everything we encounter from all periods, dating the sites is not always easy. As shown in figure 4, we collected pottery at 640 sites (or 44 percent of the sites so far recorded); we found lithics at fewer sites. More than half of our sites yielded no artifacts at all, and 134 of those sites show evidence of structures or wall foundations. Still, it is not surprising that so many sites yielded no artifacts, because many were small and unobtrusive, and most probably resulted from isolated moments of human activity. For example, among the many stone cairns that we documented (of different sizes), it is clear that some were burials, while others perhaps served as road markers, boundary markers, or as part of a larger hydraulic system on the alluvial fans aimed at water diversion. Whatever their function, human activity at these unobtrusive sites seems to have been minimal beyond their initial construction or infrequent maintenance.

In addition to these less obtrusive sites, the survey also documented more visible sites with architectural features such as miscellaneous wall alignments as well as hut circles or other domestic features (fig. 5). The survey also recorded a series of field systems within Wadi Musa itself (fig. 6). Throughout the region, in fact, the evidence of grindstone or milling stone fragments highlights the intensity of agricultural activity in antiquity. This vast agricultural regime exhibited at Bīr Madhkūr finds its closest parallel in the agricultural activity evidenced at Faynan to the north (Barker et al. 2007; Barker 2014). In terms of what was grown here and when, recently published botanical evidence from Bīr Madhkūr gives some indication (Ramsay and Smith 2013). Figure 7 is a chart showing the percent distribution of grain and chaff from Bīr Madhkūr that dates mainly in the late Roman and early Byzantine period.

For those sites with pottery, there was a range of periods recorded from the Chalcolithic/Early Bronze Age to the modern era. Most noticeable is the spike in sites where the pottery dates between the early and late Roman periods. This represents an intensification of land use in the region mostly related to agricultural production. We should highlight here the overlap between ancient and modern patterns of land use, most clearly displayed in the Bedouin reuse of Roman field systems. Also, many of the cairns, stone rings, and other ubiquitous features of the desert typically associated with semi-nomadic activity can rarely be differentiated as ancient or modern, but they do represent a consistent pattern of behavior in this environment in terms of human interaction with the landscape.

Now, what about the regional economy in classical and late antiquity? Some insights may be gained by mapping the history of agricultural practices in the region. Beginning in the period during which the Nabataeans began the slow process of sedentarization, which literary sources confirm happened between the fourth and first centuries BC, it would appear that some sites that we have recorded may date to this period of transition. This includes sites where we found no artifacts, many of which are clearly pastoral in nature, where visible remains included stone enclosures, stone circles and rings, and rock cairns. At some of these sites, we also discovered pottery. What is generally consistent and surprising is that most of these sites yielded early Nabataean pottery as well as some coarse, handmade sherds, some of which may be prehistoric in date. The consistent overlap of these Nabataean and handmade sherds at sites of a similar nature might suggest that some of the handmade pots may in fact be Nabataean in date and may represent a pottery tradition among pastoralists not well documented in the more remote corners of Arabia beyond the city centers.

Furthermore, in terms Nabataean pastoralism, there are sites similar to those mentioned above where we collected specifically Early Roman pottery. One example includes Site #2012.227, an encampment on the north bank of Wadi Madsus and covering an area of 19 m NS x 0.50 m EW. Figure 5 depicts one of the hut circles recorded there. Several similar sites were recorded throughout the study area, at several of which there was clear evidence of small-scale farming in

the vicinity, where terraces, diversion walls, and grindstone fragments were recorded.

With the construction of the military base at Bīr Madhkūr in the late third or early fourth century A.D., the site developed into a regional administrative hub of significance in the hinterland of Petra. At that time, economic activity intensified, which we see with the sudden expansion of agricultural activity throughout the area. What is clear from all of this evidence is that farming in late antiquity contrasts with the dispersed agricultural installations of the Nabataean and early Roman periods, in terms both of scale and organizational planning, which suggests that administrative control over food production was more centralized in late antiquity (cf. Lavento et al. 2007). This has important implications pertaining to the locus and distribution of power in the ancient world, and the role of elites (and others) in the management of regional resources for social, political, or economic enhancement.

Lastly, in order to understand regional trade patterns as well as trade along the ancient Incense Route, we conducted limited excavations at the caravan station of Khirbet Sufaysif, where erosion and looting had all but destroyed the site (fig. 8). The results of our excavations suggests that the initial phase of occupation at Khirbet Sufaysif was in the first century A.D. and continued into the early second century. There is also limited evidence of occupation in the late fifth to sixth century A.D.

To sum up, we know much more about the rural economy of Petra than ever before. Farming, herding, trade, and mining, only to name the most prominent of economic activities can be seen in varying degrees of regional intensity throughout classical and late antiquity. All of this evidence informs the economic relationship between Petra and its vast hinterland, and moves us forward in our understanding of the role of Petra in the ancient economy. For example, we know more now than ever before about the nature and type of pastoral sites in the region and of the broad range of agricultural practices from subsistence farming by small groups to farming at a more industrial level in antiquity. Furthermore, in terms of the interconnectedness of the various types of sites documented in the region, networks of communication and exchange linked all of our sites together, from the various towers and caravan stations to

the smallest stone cairn. The ancient Incense Route also passed through the region, which above all helped to finance Petra's urban development.

The Bīr Madhkūr Incense Route Initiative

All of the archaeological work conducted so far addresses the basic research questions outlined above, but there is another essential question that frames our work at Bīr Madhkūr—basically, why do what we do? In terms of a response, intentions are always good, and the mission, it seems, is to show always how the past is relevant in the present—after all, “history repeats itself,” a phrase often repeated. There is also value in our shared heritage. In our situation, it seems, the real issue is how to make the cultural landscape more relevant to communities occupying the same landscape today. In other words, through engagement with local and regional heritage, the past may become more relevant when present-day communities (particularly those in extreme poverty) can visualize and hopefully experience advancements or benefits in their social or economic conditions. That's the idea, at least.

As one of several communities in Wadi Araba, Bīr Madhkūr belongs to one of Jordan's major “poverty pockets.” In fact, Wadi Araba itself tops the list of poverty-stricken regions in Jordan. This is based on the statistic that 87.5% of households in the region subsist below the poverty line of 556 JD per year, as measured in a 2008 World Food Programme Report (<http://www.wfp.org/content/jordan-food-security-survey-poverty-pockets-september-2008>); the same report provided a breakdown of monthly expenditures, with depressing results for health, education, and residence. This poverty is due in part to the high birthrate and subsequent larger households. The average size of households in Wadi Araba, for example, is 8.20% compared to the national average size of the Jordanian family, which is 5.41%. It is also due to the fact the economic opportunities in Wadi Araba are minimal.

Since its inception, one aspect of the project at Bīr Madhkūr is to address this poverty issue by engaging with the local community to integrate the regional heritage of Bīr Madhkūr and the territory around the site into the tourism sector. This began in 2007 with a concept paper (written by the author) focused on the development of an archaeological park at Bīr Madhkūr. Therein, the central idea

was to link Bīr Madhkūr to Petra via the ancient Incense Route. This concept paper was also a response to King Abdullah's call for economic development in Wadi Araba (MENAFN, *Jordan Times*, April 6, 2007). Another impetus was the fact that the entire Incense Route through the Negev in Israel had been inscribed as a World Heritage in 2005. Also, Petra (already a World Heritage) was soon to become a World "Wonder." Therefore, pocketed between two World Heritage sites and associated with the ancient incense trade, the significance of Bīr Madhkūr, and of sites in the central Wadi Araba, could not be disputed, particularly in terms of potential benefits to the local economy. When we launched the 2008 season of the project, the site of Bīr Madhkūr was in a poor state. Many of the houses built in 1970 to settle the Bedouin had never been occupied and most were in a ruined state with collapsed walls (fig. 9). Many were used as storage facilities or goat pens, and one had a large pit dug into the courtyard with a dead donkey lying within it. Meanwhile, one important resource at the site, apart from the archaeology of course, was (and remains) the abandoned police post on the hill north of the site built in 1953.

The idea to develop Bīr Madhkūr as a tourism village was adopted by the Hashemite Fund for the Development of the Jordan Badia in 2008, and between 2009 and 2010, the Hashemite Fund renovated the housing units. At that time, in addition to the George Washington University and the Department of Antiquities of Jordan, the Hashemite Fund became a contributing stakeholder. They made a concerted effort to promote visits to the site by tourists and students, but there were several snags, not least of which was that much of this development had been done with little engagement with the local community. The issues were (and remain) many and complex, but the two most significant were that those who had actual ownership of the houses had long since moved from Bīr Madhkūr. Nevertheless, they were assisted in forming a *jam-iyya* in order to receive rents from the renovated houses. This revenue essentially bypassed the local community, who had not yet unified into their own *jam-iyya* and so were less involved in the development. At that time, their role was envisioned to be more service-oriented (for example, they would be compensated for providing transportation to and from the site as well as preparing meals for visitors). This

and other matters became a recipe for tension and distrust that stalled the project for some years.

Another impediment to the goal of bringing visitors to the site was the fact that no real work had been done there in terms of a tourism infrastructure (beyond the renovation of the housing units). In other words, the site was not appealing. While our excavations in 2010 were designed to gather data on the history of the site, they were also intended to increase the site's visible presence from the tourism village. But the discovery of the hundreds of coins and a wealth of material culture in one short field season halted further excavation until that material could be analyzed (as noted above). Also, in terms of the lack of a tourism infrastructure, the fact that the territory around Bīr Madhkūr remained virtually unexplored meant that a complete narrative of the history of the site and region could not be provided to visitors. It also meant that no assessment could be accomplished regarding the impact tourists might have on the landscape.

The main benefit from all of this was that we could focus all of our efforts on the survey of the region. This gave us time to build a database of sites that could be used as a basis for a cultural impact assessment relevant to all sorts of potential development activity in the area. This also allowed for a more complete understanding of the interconnectedness of all of these sites and their relationship to Petra and its history.

In terms of site development, very little progress was made at Bīr Madhkūr until 2015. An important exception was that the local community had formed their own *jama-iyya*, and so they now became more involved as a stakeholder in the development work at the site. Even the women of the community seem to have formed a separate *jama-iyya*. These developments were important because community engagement has been and remains an important element of our work at Bīr Madhkūr. In addition to working with many from the local community during the course of the project, the project trained three individuals in the techniques of archaeological survey. Also, two individuals from the local community were trained in architectural conservation, which began in 2009. Lastly, the project director brought a George Washington University language student to Bīr Madhkūr in Summer 2014 to begin working with the local school

children to assess levels of knowledge of the cultural landscape as well as teach the school children about what our team at Bīr Madhkūr was hoping to accomplish toward regional economic development. Therefore, with the local community more engaged in the work that we were attempting to accomplish, the opportunity arose of returning to the initial concept of developing a regional park and of re-integrating Petra with its hinterland to promote economic development in Wadi Araba.

In 2015, in order to further this initiative to integrate Bīr Madhkūr into the tourism sector and to engage and employ the local community in heritage and tourism, financial support from USAID-SCHEP was sought and granted. Under USAID-SCHEP support and currently, one specific goal of the overall plan is to assess and revitalize the various routes to and from Bīr Madhkūr, especially the tracks that link Bīr Madhkūr and Petra. These are: 1) the trail from Petra to Khirbet Sufaysif (the Incense Route itself); 2) the trails from Petra to Bīr Madhkūr via Umm Ratam; 3) trail from Beidha to Bīr Madhkūr; 4) trails that show the link between the copper producing area of Abu Kusheiba to the south of Bīr Madhkūr and Faynan to the north; and 5) nature/adventure trails in to the north, south, and east of Bīr Madhkūr. Another goal is to further the process of preservation and the interpretation of Bīr Madhkūr itself in order that this ancient site and routes to it are more presentable and comprehensible to the public. We also want to ensure that members of the local community receive training in the skills necessary to conserve and protect the local heritage at Bīr Madhkūr and regionally throughout the year.

We began this work with USAID-SCHEP support in Summer 2015. Our focus while in the field was 1) to assess damage caused by bulldozing when the modern village was constructed; 2) to develop and begin the implementation of a site rehabilitation plan based on this assessment; and 3) to map and develop one of the trails from Petra to Bīr Madhkūr via Umm Ratam.

In terms of site rehabilitation and conservation, we needed to address the damage to the site caused by the bulldozing that occurred when the modern houses were built as well as the ongoing erosion that resulted. In fact, a large portion of the site was destroyed along its western edge when the housing units were built, and a huge spoil pile was left in the southwest corner of the site full of

displaced artifacts. In order to prevent further erosion, we built a terraced pathway along the edge of the site (fig. 10). This was integrated with other pathways around the site as well as a low-lying stone perimeter wall around the archaeological features (fig. 11).

Other work included the partial removal of the bulldozed debris pile in the southwest corner of the site, part of which we sifted to assess the amount of artifacts within it. For what remained, we created stone-lined containers adjacent to the debris pile and had the material transferred to it for future sifting. We anticipate this serving as a training unit for student visitors to learn excavation methods and techniques. We also worked along the north edge of the site, adjacent to the well, to deal with erosion issues. Lastly, we focused on conserving the architectural features at the northwest corner of the site. This served as a training program for two members of the local community to learn conservation methods.

In addition to the site rehabilitation and conservation work at Bīr Madhkūr, another important goal in 2015 was to examine how best to integrate Bīr Madhkūr and the region into Jordan's broader tourism network, specifically as it relates to Petra. This meant examining one of several of the land routes between Bīr Madhkūr and Petra and assessing it in terms of its cultural and natural heritage value. Several factors had to be considered. These were: 1) route selection; 2) methods of documenting and mapping the route; and 3) strategies on maintaining the route. Given time constraints, and factoring in the issue of accessibility, we opted to map, describe, and assess the Wadi ad-Dlayih route (fig. 12), which passes Qasr Umm Ratam and is one of the most direct trails to Bīr Madhkūr.

In terms of documenting and mapping this route, our goal was to develop a procedure that could be standardized and easily implemented. The idea was to design a template for the future documentation and assessment of additional routes in the region, and then eventually of linking these routes to other major sites such as Faynan and Petra. And so we designed a standardized form with which we could plot the route and document features and transitions along it. Guiding this work was the decision to use the U.S. Forestry Service's

methodology for conducting trail inventory and condition assessment, which we modified to fit local conditions (fig. 13).

Furthermore, in terms of documenting the route, it was necessary to account for the various landforms across which the route passed. Therefore, we divided the entire route into 15 sections, and a form was completed for each. This allowed for the assessment of value, difficulty, and risk along each section. Each section was then plotted, and cairns were set up to maintain the visibility of the trail throughout its course. Both the trail itself and the cairn markers were mapped, in order to facilitate future inspection and maintenance of the route (fig. 14).

The training program in trail assessment, repair, and maintenance lasted a total of four weeks, which was concurrent with the documentation and mapping of the trail itself. This training program, which followed a general presentation on mapping and mapping techniques to members of the local community, met with some success (fig. 15). One important aspect of the training program was the successful plotting and mapping of the trail itself, which the trainees themselves identified. Since the forms were in English, our team managed the descriptions and most of the technical details—plans to have these translated into Arabic are underway. Meanwhile, the trainees assisted with the value assessments along the trails. This was a component of their training as future guides. A significant amount of time was spent also in identifying sections that required repair and conducting hands-on work to demonstrate how the trail should appear once fully developed. This all proved quite successful.

There were some trials, errors, and tribulations in the design and implementation of the training program. Several factors had to be considered beforehand and many more had to be dealt with once the training began. The most limiting factor was that the local community selected the trainees, which meant that some trainees did not have any interest or enthusiasm to learn new skills. The varying levels of education and the different ages of the trainees were also factors. Eventually, however, everyone seemed engaged in and enthusiastic about our joint efforts, as well as the potential for future economic opportunities. Another limiting factor concerned the two USAID-SCHEP site stewards. While personable and competent, these individuals were assigned to the project—the project director was not consulted about the selection; and in 2015, they were

rarely present and offered little support to the project. For example, neither site steward accompanied the team while working to develop the trail.

In 2016, again with support from USAID-SCHEP, we returned to Bīr Madhkūr in order to install signs at the site, to engage in further conservation work, and to work on the trails. We were also funded to renovate one of the Bedouin houses nearest to the site for a community development center (fig. 16). On August 1, 2016, the project concluded its collaboration with USAID-SCHEP when our contract expired. There were various reasons not to renew the contract, the most important of which was that views differed pertaining to next steps as well as the nature and extent of community engagement. The project's current goal is to continue the work outlined above in terms of networking Bīr Madhkūr to other regional, heritage assets through the trail systems (especially along the Incense Route), as well as to continue developing the site for tourism. Concurrently, the project aims and seeks support to develop programs that will engage with the children of Bīr Madhkūr on topics related to local heritage. We also aim to work more closely with the women of the community in craft production of products related to the ancient incense trade.

Conclusion

To sum up, the project has found parallels pertaining to economic activity in Wadi Araba in the past and today. Once before, the region was economically depressed. Beyond the period when the Nabataeans began transforming landscape with small-scale farming ventures and mining activity, and when they crossed the landscape with camels laden with incense products, the region and Petra itself suffered from the economic depression of the third century A.D. At that time, Diocletian, senior emperor in the East, understood the economic impoverishment of Petra and its hinterland, because this was not a local phenomenon. Everywhere, everyone struggled, and most bartered for their daily necessities. Yet, Diocletian saw potential. In Wadi Araba, the resources were there. One key reason to build the fort at Bīr Madhkūr was to revive the economy, to bring a seemingly barren landscape into production (particularly in agriculture), and not least to control that production. Bīr Madhkūr became an administrative and economic hub in the territory of Petra as a result.

Reflecting on what Diocletian accomplished, or what he intended to accomplish, there is a lesson to be learned. When we survey the landscape today, what we see is similar economic impoverishment. And still the resources are there. Even modern responses to this economic stagnation mirrors what Diocletian did to a small degree. For example, there is a master plan being implemented today for Wadi Araba by the Jordan Valley Authority. The main thrust of it being to boost the local, agricultural economy by building farms, wells, and dams (sustainability is a mute issue in this instance, however). Neglected by most planners however, are the cultural resources that have the potential of benefiting the local community in the long-term. And yes, the past is relevant in the present, and helping the local community capitalize on and gain a sense of understanding and ownership over these heritage resources, seems like a worthwhile endeavor.

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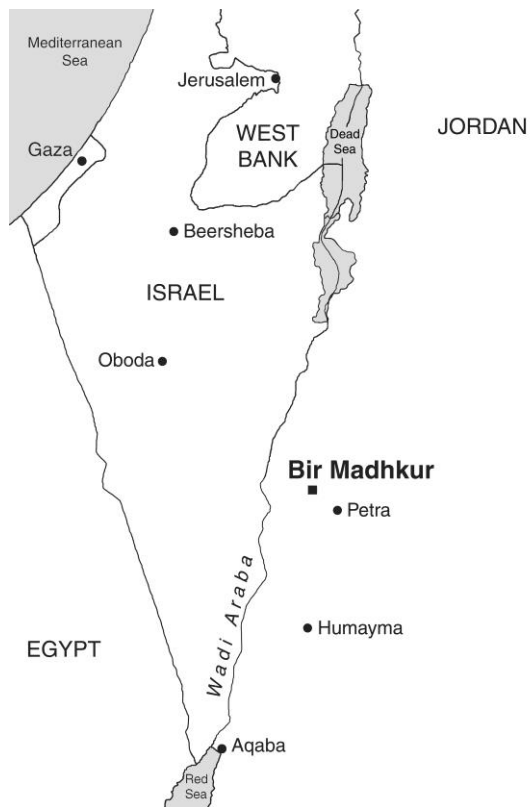


Figure 1. General regional map showing location of Bir Madhkūr

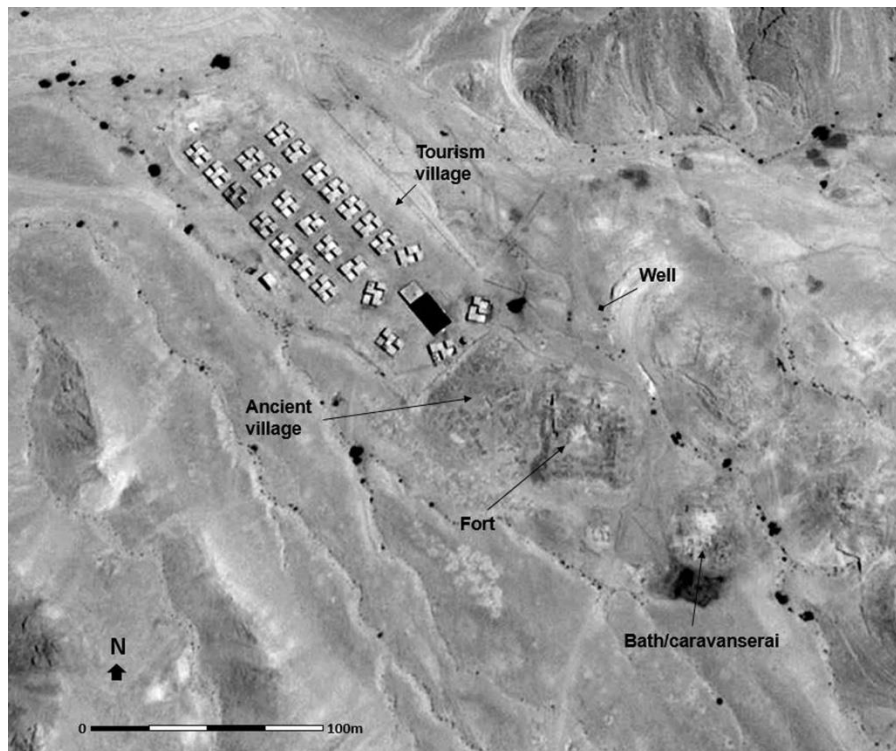


Figure 2. Bir Madhkūr from the air showing major features at the site (image courtesy of GeoEye).

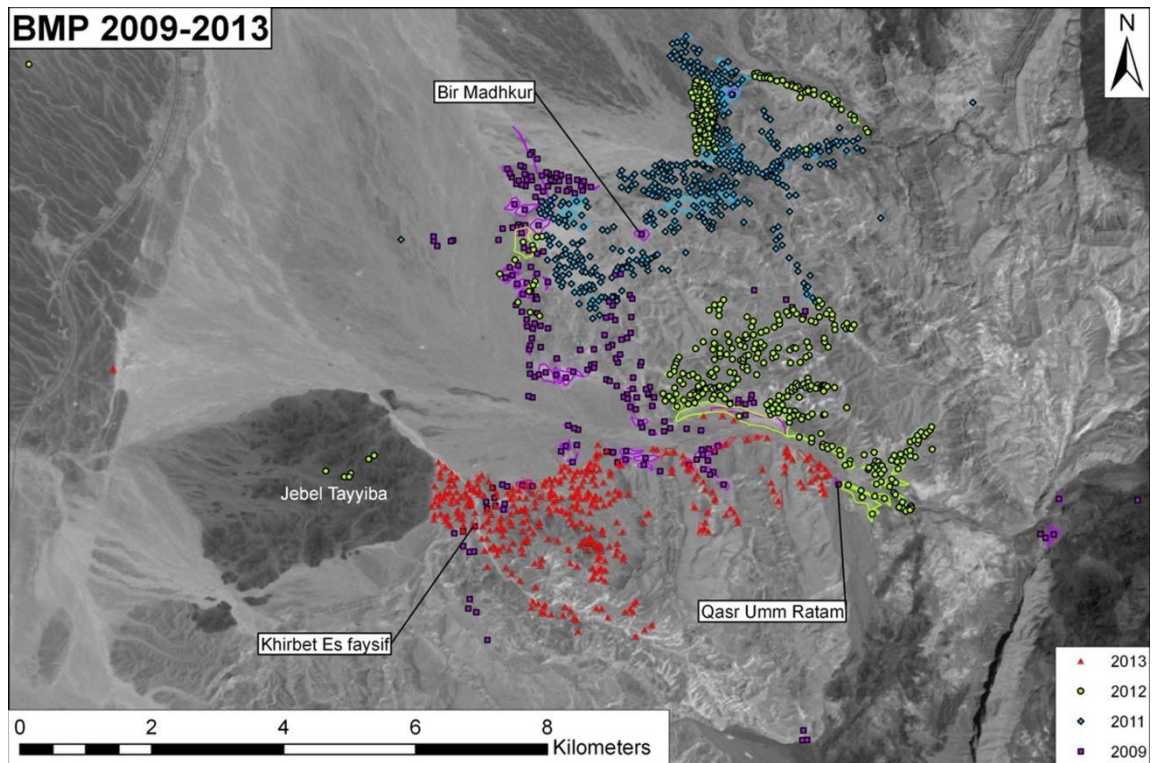


Figure 3. Map of survey area with sites plotted (image courtesy of GeoEye)

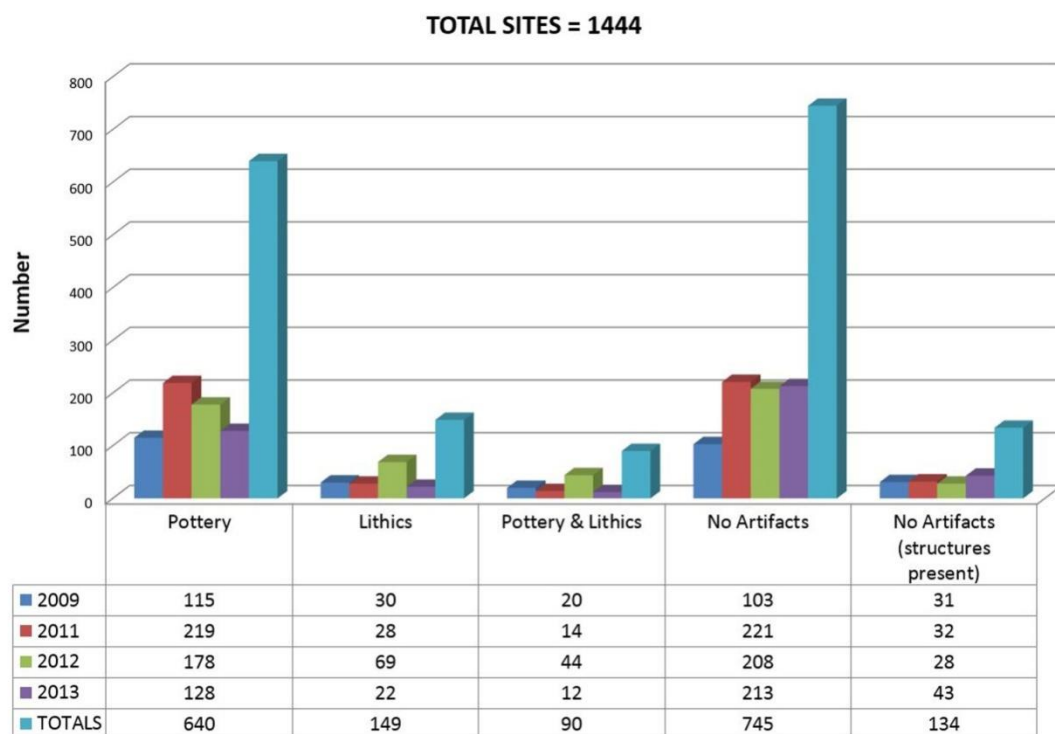


Figure 4. Diagram showing the relationship between sites recorded and artifacts discovered.



Figure 5. Large hut circle in Wadi Araba (Site #2012-227; image by A. M. Smith II)



Figure 6. Ancient agricultural fields along north bank of Wadi Musa (image courtesy of GeoEye)

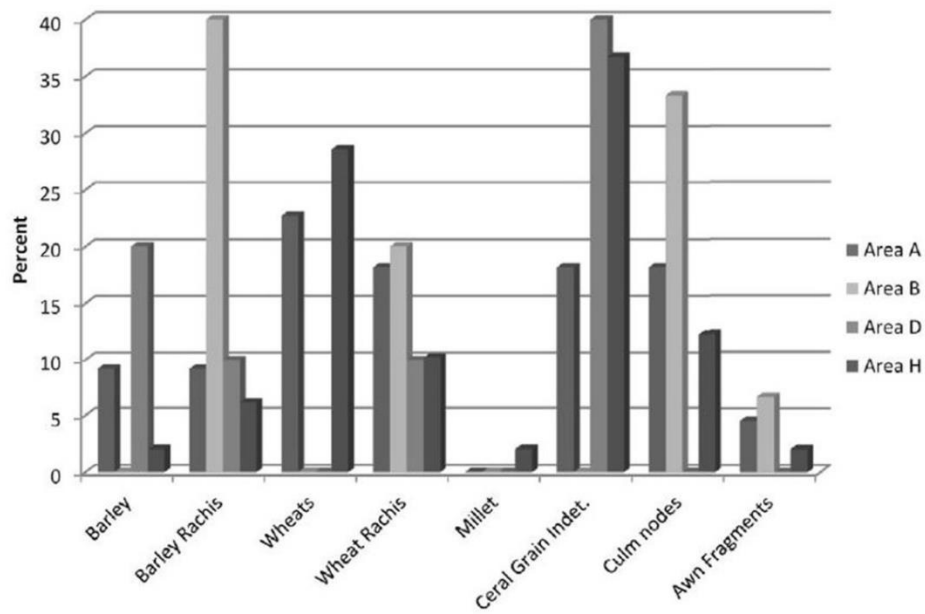


Figure 7. Botanical evidence from farmhouse west of Bir Madhkūr (from Ramsay and Smith 2013)



Figure 8. Aerial view of excavation areas of the caravanserai Khirbet Sufaysif (image by A. M. Smith II).



Figure 9. Oblique view of Bīr Madhkūr in 2008 before renovation of the housing units. Notice the collapsed wall of the some of the units. Image by A. M. Smith II



Figure 10. Edge of ancient site disturbed by bulldozing in the 1970s. Notice the debris pile in the background. This is the beginning of our work consolidating the western edge of the site. Image by A. M. Smith II

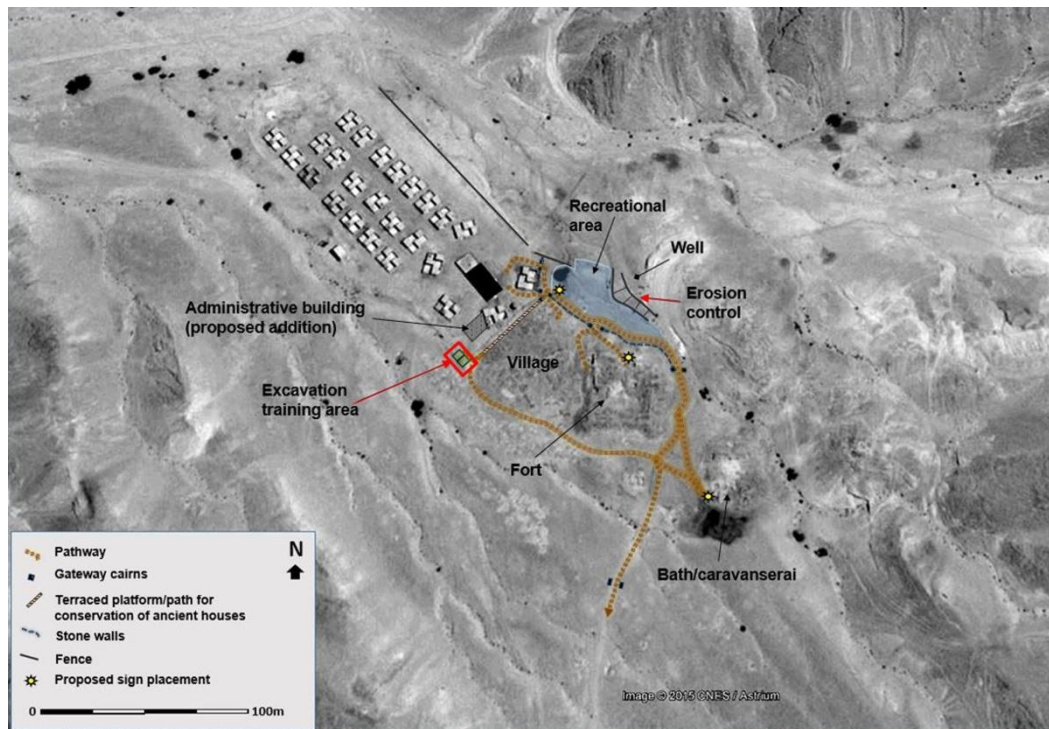


Figure 11. Site map of Bīr Madhkūr showing the pathways, signage placement, and other features at the site (image courtesy of GeoEye; modified by A. M. Smith II)



Figure 12. Map showing the Wadi ad-Dlayih trail between Bīr Madhkūr and Petra documented in 2015 (image courtesy of GoogleEarth; modified by A. M. Smith II).

BMIRP - Trail Management Objectives Trail no. ____ / Sec. no. ____

Wadi System(s): _____ Mountain District(s): _____

Trail Name: _____ Trail Number: _____

Beginning Termini: _____ Lat: _____ Lon: _____ Alt: _____

Ending Termini: _____ Lat: _____ Lon: _____ Alt: _____

Trail Inventory Length: _____ Kilometers Trail Mileage Source: ☐ Wheel ☐ GPS ☐ Map ☐ Unknown

BMIRP-TMO Trail Section

Section Beg. Termini: _____ Beg. Node (km): _____

Section End. Termini: _____ End. Node (km): _____

Section # _____ Lat: _____ Lon: _____ Alt: _____

Designed Use Objectives

Trail Type (Check one): ☐ Standard Terra Trail ☐ Other: _____

Trail Class (Check one): ☐ 1 (Primitive/Undeveloped) ☐ 2 (Simple/Minor Dev.) ☐ 3 (Developed/Improved) ☐ 4 (Highly Developed) ☐ 5 (Fully Developed)

Design Parameters (Fill in all that apply)

☐ Tread Width (cm) ☐ Target Grade (%) ☐ Short Pitch Maximum (%) (up to 200' lengths) ☐ Target Cross-Slope (%) ☐ Clearing Width (cm) ☐ Clearing Height (cm) ☐ Switchback Radius (cm)

Target Frequency Per Year (Fill in all that apply)

☐ Trail Opening ☐ Tread Repair ☐ Drainage Cleanout ☐ Logging Out ☐ Brushing ☐ Snow Trail Grooming ☐ Condition Survey

Notes

Trail Usage

Hiker / Pedestrian: ☐ Pack & Saddle: ☐ All Terrain Vehicle (ATV): ☐ 4WD Vehicle > 50": ☐

Designed (Check one): ☐ Managed (All that apply): ☐ From date (mm/dd): _____ To date (mm/dd): _____ From date (mm/dd): _____ To date (mm/dd): _____

Travel Management Strategies

Risk Assessment (Check any that apply)

☐ Falling / Slipping

Special Considerations (Check any that apply. Underline appropriate chapter in parenthesis. Provide specifics and reference information below.)

☐ Shared System (shared with other system road or trail) ☐ T&E or Sensitive Species Present (Plant / Wildlife) ☐ Heritage Resource Present ☐ Easement across Private Land (Existing / Needed)

Photo Log

| No. | Description | Direction | Camera & Date |
|-----|-------------|-----------|---------------|
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Value Assessment of Heritage Landscape (rank 6-5 and specify)

Historic: ☐ Scientific: ☐ Aesthetic: ☐ Natural: ☐ Social: ☐

Recorder: Name: _____ Signature: _____ Title: _____ Date: _____

BMIRP-TMO Form v4 - Side 1 (August 2015) Page ____ of ____

BMIRP-TMO Form v4 - Side 2 (August 2015) Page ____ of ____

Figure 13. Documentation forms developed for the recording the trails

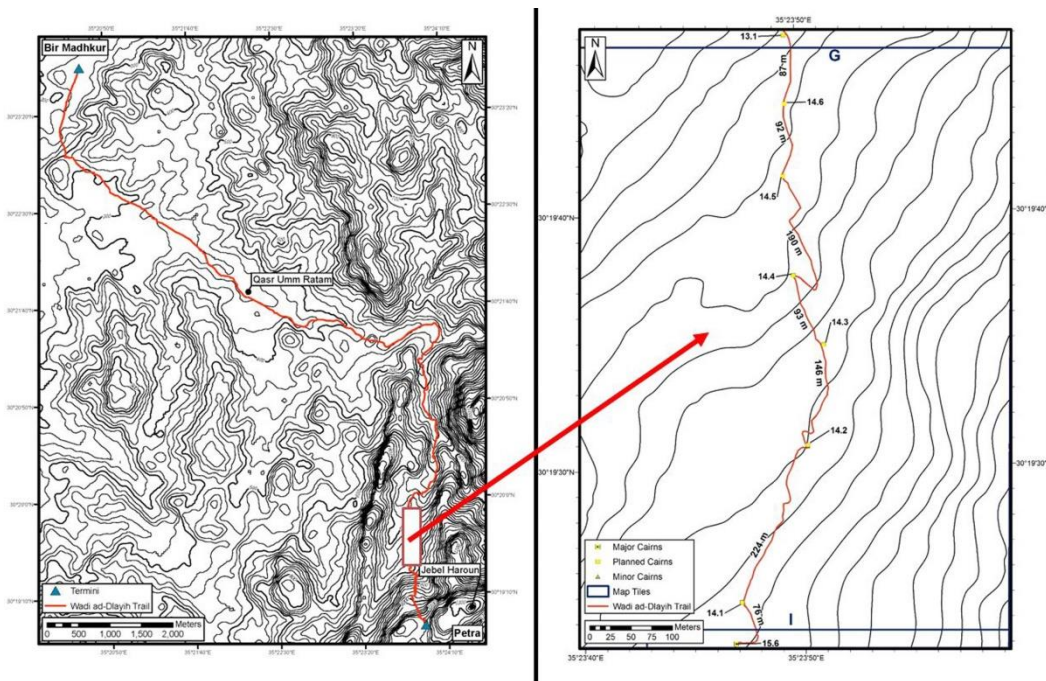


Figure 14. Map of the upper portion of the Wadi ad-Dlayih trail showing plotted markers (image by A. Kay)



Figure 15. Workshop with the members of the local community (image by A. M. Smith II)



Figure 16. Work being conducted renovating a housing unit to serve as a community center (image by A. M. Smith II)



ABSTRACTS OF UNPUBLISHED PAPERS PRESENTED AT THE CONFERENCE

Ma'ân Ottoman Heritage Project: Historical study of a city at the crossroads.

Soizik Bechetoille and Norig Neveu

IFPO, Amman

At the beginning of the 20th century, Ma'ân was an important commercial crossroads, located on the route of the Syrian pilgrimage to Mecca and between two natural units: the Southern plateau of *Bilâd al-Shâm* and the Northern Arabian Peninsula. The city was an interface of regional mobility which became more intense with the construction of the Hedjaz railway in 1904. Ma'ân was divided into two distinct villages whose names reveal its in-between situation. The main village was called *Ma'ân al-Hijâziyya*. The second village was called *Ma'ân al-Shâmiyya*. Ma'ân therefore constitutes a border region and the city was turned northward as well as southward. Its architecture reflects these specificities: one of the most characteristic features is the use of raw bricks as building material which is quite rare in other Ottoman Transjordanian cities.

This paper presents an on-going project of survey of the architectural heritage of the Ottoman towns of *Ma'ân al-Hijâziyya* and *Ma'ân al-Shâmiyya*. This project is cross disciplinary and associates architectural studies, archaeological tools and historical method. Through an inventory of the current remains and a study of typological and morphological characteristics of the urban fabric we aim to document the Ottoman social history and heritage of the city. Our method is to set up a census form for each block and per building in order to apprehend the architectural and urban landscape as a whole. We also use oral history, archival images and documents to understand the urban forms. This survey sheds light on an important aspect of the Ottoman social and economic history of the city and its region. In a perspective of tourism development in the governorate of Ma'ân, this may increase the awareness of local communities about the Ottoman architectural heritage of the city and potentially its enhancement.

Desert kites and Final PPNB hunters' campsites in Jibal al-Khashabiyeh: Latest results of the South Eastern Badia Archaeological Project (Jordan).

Mohammad B. Tarawneh, Wael Abu-Azizeh, Rémy Crassard and Fawzi Abudanah

Al-Husseini Bin Talal University and IFPO- Amman

Although desert kites are widespread across Middle Eastern and Central Asian arid margins from Yemen in the south to Uzbekistan in the north, their main concentration is in the *harra* basalt landscape of southern Syria and north-eastern Jordan. We have recently been able to discover the first evidence of “Desert Kites” in the South Eastern Badia of Jordan in 2013, 2014, and 2015, work was resumed in 2016 in Jibal al-Khashabiyeh area, located at 90 km east of the Jafr Basin. This fieldwork season focused on the excavation of a selection of “Desert Kites” part of a characteristic chain organization extending over almost 20 km long. The soundings carried out in circular cells located on the surroundings of the star-shaped enclosures of the kites. This recent discovery brings new data modifying considerably our knowledge of these late prehistoric structures. We suggest that these remains might constitute hunting outposts directly related to the “Desert Kites”.

Evidence of important Late Prehistoric (Neolithic-Chalcolithic-Early Bronze Age) human occupation in this area such as stone enclosure campsites, as well as the specialized flint workshops, provide an ideal framework to consider a general reconstruction of the occupation dynamics, and test the hypothesis of a possible correlation with the hunting subsistence strategies. Strong evidences support direct chronological relationship of the campsites with hunting mega-structures known as “Desert kites”, identified in close spatial connection. Radiocarbon dating confirmed the chronological attribution of the sites to the Final PPNB (beginning of the 7th mill. cal. BC). The lithic assemblage is therefore of major interest as it allows one of the first chrono-cultural comparisons to be made for southeastern Jordan – a key region at the gates of the Arabian Peninsula – with neighboring arid regions across the southern Levant.

A First Radiometric Chronology for a Megalithic Structure in Jordan- Khatt Shebib Using Luminescence Dating of Rock Surfaces.

Sahar Khassawneh

Yarmouk University

Stone structures are common features of archaeological landscape in the world. “Khatt Shebib” is a unique form of linear structures exists in the south of Jordan. It is a dry-stone construction of a long wall with several branches extending of

the main line, the total length of the wall is ~150 km. The wall is presumed to be the longest linear structures found in the Levant, but little is known about the purpose nor the age of the wall, or whether it was built all at once or in different periods, because of the lack of direct dating method to the wall structure. Dating the wall was mostly done as a part of other archaeological surveys and studies for the surrounding landscape. Here we introduce the first radiometric dating method for the wall using optically stimulated luminescence dating of rock surfaces (Sohbati et al., 2012, Freisleben et al., 2015). we apply luminescence rock surface dating to two rocks taken from the wall near the site of Petra to determine the degree to which the surface had been bleached (exposure to light) prior to burial (using in wall construction). The preliminary results showed that this part of the wall was constructed ~2740 years ago, earlier than what is known about the wall. This age is close to first occupation of the Khirbet Ayl site located ~ 15 km to the west, and it is the first independent radio chronometric age for any part of the Khatt Shebib linear structure.

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1. Freisleben, T., Sohbati, R., Murray, A., Jain, M., al Khasawneh, S., Hvidt, S., & Jakobsen, B. (2015). Mathematical model quantifies multiple daylight exposure and burial events for rock surfaces using luminescence dating. *Radiation Measurements*, 81, 16-22
2. Kennedy, D., & Banks, R. (2015). The Khatt Shebib in Jordan: From the Air and Space. *Zeitschrift für Orient Archäologie*, 8, 132-154..
3. Sohbati, R., Jain, M., & Murray, A. (2012). Surface exposure dating of non-terrestrial bodies using optically stimulated luminescence: A new method. *Icarus*, 221(1), 160-166.

Ancient Roads Network in the Hinterland of Petra.

Fawzi Abudanah

Al-Hussein Bin Talal University

This paper presents new evidence on the existence of ancient roads network in the hinterland of Petra in southern Jordan. the evidence was collected from the field in two seasons, 2011 and 2014. The fieldwork revealed a complex network of ancient roads, major and minor, connecting Petra with its hinterland and

connecting Petra with other regional urban centres. The layout, stonework and dimensions of these roads are quite similar and may indicate that they were constructed in one or two successive cultural periods. The number of roads and their layout clearly point to a community or even a state effort in planning and constructing such a complex road network. Legal aspects can be observed through the great attention given to the routes that the roads follow in the landscape, particularly in agricultural areas .

Christians in the Ma'an District in the Islamic Periods.

Robert Schick

Johannes Gutenberg-Universität Mainz

For how long were sizable numbers of Christians present in the Ma'an District after the Muslim conquest of the 630s?

Christians are little attested in the early Islamic period either in historical sources or by archaeological evidence, other than at Jabal Harun. However, as soon as the Crusaders arrived in the early 12th century, evidence for local Christians in the Petra and Shobak areas picks up again, indicating that local Christians had continued to be present in the earlier Islamic periods as well.

But once the Crusader presence in southern Jordan ended after 1187, the evidence for Christians dwindles again to almost nothing beyond a church at Udhruh from the Mamluk period.

That situation leaves gaps before and after the Crusades when few traces of Christians can be found. But does the lack of evidence for Christians during those gaps genuinely reflect their having dwindled to small remnant communities as early as the seventh century or only our not yet having detected their presence?

Endangered Archaeology in the Ma'an Governorate.

David Kennedy

University of Western Australia

Petra is the focus of almost all interest in southern Jordan. On their way to Wadi Musa tens of thousands of visitors pass through delightfully scenic landscapes generally unaware of the rich cultural heritage all around them. Since the 19th century scholars have known of numerous important sites in the wider region,

from the great Roman legionary fortress at Udruh to the early Islamic *qusur* and irrigation systems east of Ma'an. Now, in the last half century, ground surveys in the region by MacDonald and by Abudanh and colleagues have added several hundred further sites. Unlike the governorates of north-western Jordan which have seen a massive growth in population and development - with catastrophic consequences for cultural heritage, the Ma'an Governorate may seem immune. Sadly, here, too, development, albeit slower and less dramatic, is having a deleterious impact. This paper will illustrate the ways in which cultural heritage is being threatened, damaged or destroyed and aims to alert archaeologists to those dangers but also to the opportunity to identify and record now before it is too late – as it often is elsewhere in Jordan. One very cost-effective method is through aerial reconnaissance. The Aerial Archaeology in Jordan (AAJ) project project has been engaged in this effort for over 20years involving hundreds of hours of flying and all of its thousands of photographs can be viewed and used on the Aerial Photographic Archive for Archaeology in the Middle East website (<http://www.apaame.org/>).

Nabataeans to Byzantine: Es- Sadaqa (*Zadakathon*) in the 1st-7th centuries AD.

Mohammed Nasarat

Al-Hussein Bin Talal University

Basically, Es-Sadaqa region is part of the southern area of the Shera'a in southern Jordan, the area have flourished as part of the Nabataeans Kingdom in the hinterland of Petra. The site is located about 20 km south-east of Petra, 7km south of Khirbat Ail, and 23km west of Ma'an. Es-Sadaqa was one of the major trading and agricultural areas in the hinterlands of Petra. Also, it was one of the stations of the *Via Nova Traina* along the trade road to the head of the Gulf of 'Aqaba.

Hence, this paper deals with the history of Es-Sadaqa during the periods Nabataeans, Roman, and Byzantine, depending on both historical and archaeological sources. The main literary sources, recent discoveries, and inscriptions pointed to the importance of the site during these periods. As well as provide a plethora amount of information attested that the region witnessed

continuity of human settlement from 1st- 7th centuries AD. There is also evidence from these sources that the site was still administrative and military center in southern Jordan up to the 7th century AD.

Nelson Glueck, Deities, Dolphins and the Archaeology of the Nabateans.

Joseph A. Greene

Harvard University

Nelson Glueck is best known in Nabatean archaeology for a single season of excavation at a single Nabatean site, Khirbet et-Tannur, in 1937. Much later, in 1965, Glueck published the site, (though incompletely) in the context of a work with a wider focus under the enigmatic title *Deities and Dolphins*. Before digging at Khirbet et-Tannur, Glueck had conducted multiple, wide-ranging archaeological surface surveys in Transjordan, the results of which he published with admirable promptness in a series of reports in the *Annual of the American Schools of Oriental Research* (1934, 1935, 1939, 1951). In these surveys Glueck had identified and mapped hundreds of sites, among which were, of course, many with traces of Nabataean occupation. This included Khirbet et-Tannur, where he dug briefly before moving on to excavate for three seasons at the Iron Age site of Tell el-Kheleifeh, near Aqaba, in 1938–1940. Despite his earlier engagements with Nabatean archaeology, Glueck never considered himself a “Nabataean archaeologist,” nor what he wrote in *Deities and Dolphins* to be an “Archaeology of the Nabataeans.” It was instead, as Glueck subtitled the book, *The Story of the Nabateans*.

Rather than a “Nabataean archaeologist,” Nelson Glueck was a “Biblical archaeologist” in the mold of his mentor and teacher, W. F. Albright. In Palestine in the late 1920s, Albright had trained Glueck in the techniques of pottery typology, training that served Glueck well in his later explorations east of the Jordan River (or at least as well that typology was then understood). Glueck followed his teacher Albright in other ways. In *The Story of the Nabateans*, Glueck approached the synthesis of ancient texts and Nabataean material culture in a manner then very typical of Biblical archaeology, drawing principally on ancient texts for the sequence of events, the “story” as it were, supplementing that “story” with “illustrations” from material culture. Thus Glueck’s 1965 book is a

narrative history based on the principal ancient written sources then known about the Nabataeans—and still the principal sources known today—the writings of the geographer Strabo and the historian Josephus.

This limitation by no means diminishes Glueck's early efforts to enlarge knowledge of the Nabataeans. As with later critiques of Glueck's interpretations of the settlement history of Transjordan in the Bronze and Iron Ages (which we now know to be incomplete) or his original insistence that Tell el-Kheleifeh was biblical Etzion-Geber (also in error), this critique of Glueck's treatment of Nabataean archaeology has the advantage of decades of hindsight, hindsight made possible by the work of scores of successors who truly were "Nabataean archaeologists." It is in such hindsight that we can fairly and fully appreciate Nelson Glueck pioneering contributions to the archaeology of the Nabateans.

Cleaning and new elements on the chronology of the Qasr al Bint in Petra.

François Renel

IFPO- Amman

Since 2015, the French archaeological mission is working on a site management program in the temple of Qasr al-Bint in Petra. In this context, the work carried out on the monumental staircase and the pronaos gave new elements on its construction and abandonment. A sounding in the southwestern corner of the pronaos led to the discovery of a monumental pre-temple state dating from the second half of the second century to the first half of the first century BC. The clearance of the monumental staircase has also shown the existence of two different states, the last one being dated from the end of the 1st century AD. Finally, a medieval dwelling had been studied on the whole area. Its dating, between the 9th and 11th centuries, brings new insights into the medieval history of Petra

The Archaeology of the Hijaz Railway and the associated Late Ottoman Defensive Landscape.

John B Winterburn

Independent scholar

The Hijaz Railway was built to transport hajj pilgrims from Damascus to Mecca and arrived in Ma'an in 1904 and had reached Mudawwara by 1905.

It was more than a railway and it became a *de-facto* frontier of Ottoman administration. It extended control and influence to the far reaches of the Ottoman Empire but it threatened British military interests in Egypt and the Suez Canal, the link between Britain and its Empire in India and was described as a 'German high-road to Egypt'.

The outbreak of war between the Entente and Axis powers in 1914, highlighted the military significance of the railway. With the start of the Arab Revolt in June 1916 the railway became a vital communications link supporting the Ottoman garrisons in Madinah and Ma'an and it was the focus for attacks by Arab and British forces.

The capture of Aqaba, by Arab forces in June 1917, was unexpected by the Ottoman and British High Command and the arrival of Emir Feisal's Northern Arab Army was a threat to the garrison in Ma'an and the continued operation of the railway. The German general, Eric von Falkenhayn arrived in Ma'an in August 1917 and supervised the rapid fortification of the landscapes around the station and southwards along the railway.

This paper will examine the archaeology of the Hijaz Railway in the Ma'an Governorate between Uneiza and Mudawwara. It will focus on the construction, the archaeology of the surviving buildings and material culture of what are the best preserved First World War conflict landscapes anywhere. It will also provide a chronology for the building of these defences.

The paper will be illustrated with historic and modern images and briefly reviews the tourism potential of the railway, buildings and the landscapes associated with the Arab Revolt.

The role of electronic DMOs in building the projected visual destination image: the case of Petra(A qualitative analysis of MoTA, PDTRA, and JTB official websites).

Jebril Alhelalat

Al-Hussein Bin Talal University

Petra is the number one tourist destination in Jordan; however, there is a debate regarding the role of the related official institutions in creating and building the desired image of Petra (exclusively the Ministry of Tourism, Petra Tourism and Development Region Authority, and Jordan Tourism board). Within this research, after a background of the traditional image building techniques, and through a content analysis of the images and statements published in the three previously mentioned websites about Petra, the focus is on analyzing the aspects of Archaeological sites, people & way of life, and nature & landscape as destination image.

The aim is to reach a conclusion about the official institutions' role in what is called the 'projected visual image' of Petra among potential tourists through analyzing the specific content within the pre-designed evaluation criteria.

Sustainable Cultural Heritage through Engagement of Local Communities Project (SCHEP)

Nizar Al Adarbeh and Jehad Haron

SCHEP Project- Amman

Jordan hosts a vast number of archaeological sites that are important cultural heritage resources (CHRs) for the country. Besides the well-known tourist and World Heritage sites, these include numerous other locations that could have substantial tourism appeal if properly developed using a sustainable preservation model that ensures their viability as long-term resources for Jordan. Jordan also abounds with living cultural heritage traditions within its diverse range of different types of communities. The USAID Sustainable Cultural Heritage Through Engagement of Local Communities Project (SCHEP), implemented by the American Center of Oriental Research (ACOR), aims to enable local communities to preserve and promote cultural heritage resources through site development projects that engage and employ local communities in sustainable site preservation, management and promotion, while simultaneously developing an enabling environment through building and strengthening a collaborative community of practice with a multi-level stakeholder focus among heritage professionals, academic, government, tourism and others to support

effective and sustainable cultural heritage resources preservation and management.

Many of Jordan's cultural heritage resources are located within underserved areas and poverty pockets, where local communities are unable to capitalize on the tourism potential of these sites. SCHEP emphasizes grassroots capacity building to create skilled teams necessary to build sustainable capacities for effective preservation, management, and development of Jordan's CHRs at the local level with the ultimate goal of increasing tourism to these cultural heritage sites, bringing economic benefits to the communities and creating new jobs and better employment opportunities.

In its third year of implementation, SCHEP is active in engaging different communities across Jordan in cultural heritage preservation and interpretation. SCHEP is supporting nine cultural heritage sites including Ghawr as-Safi (Karak), Busayra (Tafila), Umm al-Jimal (Mafraq), Bir Madhkur (Wadi Araba), the Temple of the Winged Lions (Petra), Bayt Ra's (Irbid), Wadi Ramm, Ayla (Aqaba), and Madaba. This paper will focus on presenting the accomplishments of the project at three sites relevant to Maan Governorate including Petra, Wadi Ramm, and Wadi Araba.

Traditional foods and tourism: the experience of tourists in Petra, Jordan.

Ma'moun A. Habiballah

Al-Hussein Bin Talal University

Since ages, people traveled for food; until now, food is still one of the main attraction for traveling, either for tourism or for merchandising. Nowadays, food becomes a tourism attraction that compete traditional ones such as sun, sea and sand; it represents a sensory experience which enables tourists to consume other cultures. At the same time traditional food tourism benefits tourism host countries by reducing seasonality of tourism and by amplifying its positive economic effects. In spite of this importance of traditional food tourism, there is a paucity of research about food tourism in the Arabic region in general and in Jordan particularly. The current study aims to bridge this gap by measuring ethnic food importance as a travel attraction and motives encouraging tourists to have a traditional food experience .

To achieve the aforementioned aims, seven hypotheses were developed and examined using a quantitative methodological paradigm. This study employed self-administrated questionnaire to collect primary data; where 190 questionnaires were collected from tourists visiting Petra-Jordan during the summer of 2016. Collected data were analyzed using different statistical techniques including descriptive analyses and the standard multiple regression test.

Results of the study indicated a general tourists' belief of food as one of the top three attractions for tourism; but when it comes to Jordan, food was perceived as the least tourism attraction compared to others such as archaeological sites and climate. Another important finding reached in the current study was identifying five motives for tourists' intention to have a traditional meal experience. These motives include willingness to change and escape from routine daily food, desire to have an authentic experience, learning about other culture, willingness to share memorial events and familiarity with traditional food; these motives were able to explain 58.9% of the variance in tourists' intention to purchase traditional food .

Based on study's findings some implications were highlighted; these include a suggestion to Jordanian tourism authorities to invest more in food tourism to recover the setback in gaining traditional food tourism benefits; the authorities are also suggested to employ traditional food in the promotion of Jordan as a tourism destination. Furthermore, a recommendation was developed for hospitality organizations to enrich their food and beverage products by inserting more traditional items to their menu(s).

التغير المناخي وأثره على إدارة المياه في بادية جنوب شرق الأردن في عصر الهولوسين .

عامر صلاح السليمان

طالب دراسات عليا - إيطاليا

يلعب الماء دوراً حيوياً بالنسبة للتركيبة السكانية والحضارية في المناطق القاحلة، أكثر منه في المناطق وافرة المياه. وتحكمت موارد المياه المحدودة والموسمية في البادية الأردنية في ظهور وتوسع المستوطنات خلال

العصر الهولوسيني.

وأثر تغير المناخ، كالجفاف الكبير في الألفية الرابعة قبل الميلاد، على توفر المياه السطحية والجوفية، كما غيّر المناظر الطبيعية والاقتصاديات الاجتماعية التي احتضنتها. وأجبر هذا الأمر الشعوب على إعادة واستحداث أنظمة واستراتيجيات لإدارة المياه في المستوطنات بحيث تتكيف مع الظروف البيئية القاسية وقلة المياه . إلا أن الظروف الجيدة كفترات الرطوبة خلال العصر الهولوسيني الوسيط حيث انتشرت السهول الخصبة في البادية قد شجعت الابتكارات في أنظمة إدارة المياه.

وقد تطورت أنظمة واستراتيجيات إدارة المياه عبر الزمن، حيث أنشئت لتكون متلائمة من الناحية التقنية مع السمات الطبوغرافية والهيدرولوجية والبيولوجية لبيئة البادية.

تلقي هذه المساهمة الضوء على أنظمة إدارة المياه التي ما زلنا بصدد التعرف عليها، وكذا استراتيجيات استغلال الأراضي خلال العصر النحاسي قبل ظهور الواحات وعلى الثقافات البدوية التقليدية لجنوب شرق الأردن، خاصة وأن استراتيجيات البدو لحصاد المياه مهمة بالنسبة لعلم الآثار وعلم الجيواثر لتفسير السمات الهيدرولوجية للصحراء في عصور ما قبل التاريخ.

تأثير السياحة على المجتمعات الحلية، مجتمع البدول في البترا نموذجاً.

زينب سلامة الموسى، محمد بركات الطراونه وفردوس العجلوني

جامعة الحسين والجامعة الهاشمية

تناقش هذه الورقة نتائج الدراسة التي أجريت في منطقة البترا حول تأثيرات السياحة الإيجابية والسلبية على مجتمع البدول من النواحي الاقتصادية والثقافية والاجتماعية والبيئية. وتقرن هذه الدراسة بين مجتمع البدول الذي تم ترحيله من داخل مدينة البترا الأثرية إلى قرية أم صحيون عام 1985 وبين مجتمع البدول الذي ما زال يعيش في كهوف المدينة الأثرية في منطقة السطوح القريبة من جبل هارون. وتسلط هذه الدراسة الضوء على الكثير من المشاكل الاجتماعية والاقتصادية والبيئية في قرية أم صحيون خاصة في السنوات الأخيرة بعد تراجع أعداد السياح القادمين إلى البترا. وقد اعتمدت منهجية العمل في هذه الدراسة على إجراء مقابلات شخصية مع أفراد من فئة الشباب وكبار السن في منطقة أم صحيون وسطوح هارون وكذلك على المشاهدات الشخصية للباحثين خلال فترة الدراسة.

تفسير دلالات أسماء الأماكن حول البتراء وعلاقتها بوظيفة المكان التاريخية.

هاني الفلاحات

باحث مستقل

في نهاية عام 1993م تم اكتشاف وثائق كنيسة البتراء البيزنطية، وهي عبارة عن أرشيف الكنيسة الذي يحتوي العديد من لفائف البردي، والمكتوبة باللغة اليونانية لغة الكنيسة آنذاك، ولقد تم التعرف على مئات أسماء الأماكن الجغرافية التي ما زالت تستخدم حتى اليوم بين سكان المنطقة بذات اللفظ، رغم أن هنالك المئات أيضاً التي لم نستطع الاستدلال على أماكنها.

في هذه الورقة سنحاول التعرف على بعض الأسماء التي وردت في تلك الوثائق، وأخرى لا ندر إن كانت مذكورة فيها أم لا؛ لأن اللفائف لم يتم قراءة الممكن منها كلها، وربما زودتنا مستقبلاً بأسماء جديدة مذكورة فيها. أما الأهم في الموضوع، فهو أن الناس تداولوا هذه الأسماء تواتراً عن الآباء والأجداد دون دراية بتفسير هذه الأسماء أو دلالاتها، وهذا دليل على بعض الحقائق التاريخية التي ما زالت مدار جدل بين العلماء والمختصين حتى اليوم ولم تُحسم بعد؛ مثل: من هم بقايا الأنباط اليوم، ومن أين كانت بداياتهم.

ولأن أسماء الأماكن الجغرافية هي نتاج طبيعي لعلاقة الإنسان ببيئته، فقد أطلق الناس أسماء للأماكن الجغرافية في بيئاتهم للاستدلال عليها واستغلالها، ولم تكن هذه الأسماء بلا معنى أو غاية، فالأسماء الجغرافية لها أسباب ودلالات، ومن أهم دلالاتها وظيفة المكان، ومن هنا فإن دراسة أسماء الأماكن، ستساعدنا في التعرف على وظيفتها التاريخية، والاستدلال على قصة المكان التي ستكون من أهم المعلومات التي تقدم للزوار.

في هذه الورقة سنتعرف على بعض الأسماء الجغرافية في محيط البتراء، وسنقدم بعض المعلومات التي وردت في المصادر العربية حولها، بالإضافة إلى تصور مبدئي لأسلوب تقديمها للزوار بأسلوب مثير وشيق.

الحياة الاجتماعية في لواء معان (1924-1964).

سهام الببور

وزارة التربية والتعليم

تهدف هذه الدراسة لإعادة تقييم تاريخ لواء معان الحضاري والعمراني وحتى السياسي وتوضيح القضايا التي تتعلق باللواء في فترة الدراسة من الناحية الإدارية والسياسية والاقتصادية والاجتماعية، وتبيان ذلك من خلال المصادر

التاريخية والوثائق المتوفرة، وتبرز أهمية اللواء من إتخاذ الأمير عبد الله الأول أحد أبنية سكة الحديد في قصبة معان مقراً له (مقر الدفاع الوطني)، كما صدرت أول جريدة في شرق الأردن من هذا اللواء الذي يشكل حلقة وصل بين أطراف الشام والحجاز ومصر؛ لذا تتبع أهميته في أنه معبر الحجاج ومكان استراحتهم، خاصة بعد ضم اللواء إلى الإمارة.

تناولت الدراسة الحياة الاجتماعية من حيث السكان (البدو والحضر)، الاحتفالات الدينية والمناسبات، والمساعدات التي تم تقديمها للناس، الرعاية الصحية التي قدمت للسكان من متابعة نظافة مصادر المياه، ومكافحة الأمراض السارية (فهذه المنطقة تعد محطة لمرور الحجاج ومعرضة لانتشار الأمراض)، والحجر الصحي. وعلى الرغم من أهمية هذه المنطقة إلا أنه اكتنفها الغموض ورغم وجود بعض الوثائق التي توفرت خلال الفترة العثمانية وكذلك في بداية نشوء الإمارة، وقد سببت قلة المصادر أثراً سلبياً في دراسة الحياة الاجتماعية والاقتصادية والسياسية للمنطقة في منطقة الإمارة بوجه عام وفي منطقة الدراسة بوجه خاص.

واقع الإعلام السياحي في الأردن: حالة دراسية البترا.

منصور الشقيرات

جامعة الحسين بن طلال

تمتاز البترا عن غيرها من المواقع السياحية في المملكة بزائريها الذين يفدون إليها على مدار العام، لذا تمتعت منطقة البترا بنجاح كبير في التنمية السياحية على مستوى المملكة، استحققت به أن تؤخذ كتجربة ناجحة، بحيث يمكن الاستفادة من تجربتها في تنمية السياحة بمختلف مناطق المملكة التي تزخر بمقومات وموارد سياحية مناسبة. ولأن الإعلام السياحي يقوم بدور مهم في نجاح أي تنمية سياحية بأي مكان، جاءت هذه الدراسة التي تهدف إلى دراسة واقع الإعلام السياحي بمنطقة البترا ودوره في نجاح تجربتها السياحية، وذلك من خلال استبانة استقصاء وزعت على عينةٍ مثله لمختلف الجهات العاملة في مجال الإعلام السياحي بالبترا.

ومن أهم النتائج التي خلصت إليها الدراسة من خلال الإجابة على أسئلة الاستبانة وتحليلها إحصائياً أن الإعلام السياحي في البترا محلي بالدرجة الأولى، ويركز جهده على السائح الذي وصل فعلاً إلى البترا، وقد خلصت الدراسة إلى أن الإعلام السياحي لا يواكب الإنجازات السياحية المتحققة وذلك بسبب عدد من المعوقات ومن أهمها:

عدم توفر الكوادر المتخصصة، وعدم وجود استراتيجية إعلامية وطنية للسياحة، إضافة إلى ارتفاع تكلفة الإعلام السياحي. كما خلصت الدراسة إلى عدد من التوصيات التي يمكن أن تساهم في تفعيل الأداء الإعلامي السياحي وتذليل العقبات التي تعترضه.

السياحة الثقافية وخصائصها في مدينة البتراء وتأثير الربع العربي عليها للفترة (2011-2016م).

رامي محمد الدهون

وزارة التربية والتعليم

تتناول هذه الدراسة بالتحليل الخصائص العامة للسياحة الثقافية في مدينة البتراء الأثرية الواقعة في محافظة معان جنوب الأردن من حيث التوزيع النسبي لأعداد زوارها حسب الأقاليم السياحية المصنفة في منظمة السياحة العالمية، وأهم الجنسيات السياحية الأوروبية والأمريكية للفترة (1997-2016م)، بالإضافة إلى تحليل مدى تأثير الربع العربي على أعداد زوار البتراء من الأقاليم السياحية وعدد من الجنسيات للفترة (2011-2016م)، ودلالاتها الإحصائية عند مستوى 0.05، ولتحقيق أهداف الدراسة تم الاعتماد على المنهج الوصفي والتاريخي، والمنهج الإحصائي التحليلي باستخدام عدد من الأساليب الإحصائية البسيطة كالمتوسطات والنسب المئوية بالإضافة إلى اختبار التباين الأحادي ومعامل الاختلاف والتغير، وبينت النتائج بأن زوار البتراء يتوزعون على ثلاث فئات هي الأجانب بنسبة 80% والأردنيون بنسبة 17,5% والعرب بنسبة محدودة بلغت 2,5%، أما زوار البتراء من الأقاليم الأجنبية فقد احتل الإقليم الأوروبي المرتبة الأولى بنسبة 71,7%، والإقليم الأمريكي بنسبة 13,8% في المرتبة الثانية، وآسيا والباسفيك بنسبة 11,4% في المرتبة الثالثة، في حين شكل الزوار الوافدين من الإقليم الأفريقي وهيئة الأمم وإسرائيل نسبة 3,1%، أما الجنسيات فقد شكلت الجنسية الأمريكية نسبة 59,6%، والكندية نسبة 12,5% من زوار الإقليم الأمريكي بينما شكلت خمس جنسيات أوروبية وهي بريطانيا وفرنسا وألمانيا وإسبانيا وإيطاليا نسبة 59,3% من زوار الإقليم الأوروبي، كما بينت النتائج وجود فروق ذات دلالة إحصائية لتأثير الربع العربي على أعداد زوار البتراء في الفترة (2010-2016م)، وأن هذا الحدث ساهم في تراجع أعداد السياح الوافدين لزيارة مدينة البتراء الأثرية من جميع الأقاليم والجنسيات خاصة الزوار الوافدين من الإقليمين الأوروبي والأمريكي الذي يتميزون بطابع السياحة الثقافية.

منطقة الجفر عبر العصور التاريخية.

أنور دبشي الجازي

جامعة الحسين بن طلال

تهدف الدراسة إلى إلقاء الضوء على تاريخ منطقة الجفر ومبانيها التراثية وآبار المياه القديمة فيها، وستتناول الدراسة المراحل التاريخية للجفر منذ العصور القديمة وحتى إنشاء البلدة الحديثة، ويتضمن ذلك ما شهدته البلدة من بناء المنازل بدايات القرن العشرين ومنها قصر الشيخ عوده أبو تايه، بالإضافة لدراسة المباني التراثية الأخرى مثل: مخفر الجفر القديم، المدرسة، العيادة الصحية، المرافق الزراعية التابعة للمشروع الزراعي، كما ستحاول الدراسة تناول المحيط الآثاري والتراثي للجفر مثل منطقة باير، بسبب أن كلا المنطقتين شهدتا استقرار قبيلة الحويطات فيهما.

ومنذ الثلاثينات من القرن الماضي استقرت القبيلة بشكل نسبي في الجفر، وفي بداية الستينات أنشأت الدولة الأردنية المشروع الزراعي والإسكاني في الجفر مما عمل على مزيد من الاستقرار وتحول في النمط المعيشي للسكان.

وستعتمد الدراسة على مجموعة من المصادر والمراجع مثل: تقارير المسوحات والشواهد الأثرية في الجفر، وذكرها في كتب الرحالة الغربيين، والوثائق البريطانية ووثائق حكومة إمارة شرق الأردن.

مواقع التواصل الاجتماعي كأداة لتنمية السياحة في محافظة معان.

فارس محمد العمارات

باحث مستقل

تعتبر وسائل التواصل الاجتماعي من العناصر الهامة التي تلعب دوراً هاماً في تطبيق الخدمات السياحية الإلكترونية والتي تلعب دوراً هاماً في تنمية العملية السياحية من حيث تفعيل النظم والتطبيقات الخاصة وأصبح تزويد العملاء بالخدمات الإلكترونية واحدة من مقومات نجاح أي من القطاعات الاقتصادية والتي يأتي على رأسها قطاع صناعة السفر والسياحة، إذ تعزز الخدمات الإلكترونية والتطبيقات الحديثة من سياسات تخفيض التكاليف واختصار العامل الزمني وتعد إحدى الميزات الترويجية في سوق شديدة التنافسية تهتم بتحديث صناعة السياحة والسفر والتسويق الإلكتروني وكافة الخدمات السياحية المقدمة.

كما تشكل السياحة الإلكترونية القسم الأكبر من حجم التجارة الإلكترونية، من هذا المنطلق تم تطوير وتفعيل افضل الحلول وأحدث النظم الإلكترونية للخدمات السياحية من حيث العمل على استراتيجيات التسويق الإلكتروني لتحقيق أداء شامل ومتميز يسهم في تطوير المنظومة السياحية، لدعم التنافسية السياحية العالمية لاستقطاب السائحين والاستثمارات السياحية في ظل توافر البيئة والمناخ الاستثماري و الصناعات الداعمة لقطاع السفر والسياحة.

الهدف من الدراسة:

تتمثل أهداف الدراسة في:

- 1-دراسة ماهية مواقع التواصل الاجتماعي وفوائد استخدامها في تنمية السياحة .
- 2- دراسة الواقع الفعلي لمدى استخدام مواقع التواصل الاجتماعي في تنمية السياحة في محافظة معان .
- 3- ما هو أثر وسائل التواصل الاجتماعي على زيادة الطلب السياحي في محافظة معان .

نظرة في علاقة الأنباط مع قبائل العربية والجوار من خلال النقوش الصفوية.

إبراهيم صالح صدقة و حسين محمد القدرة

باحث مستقل، الجامعة الهاشمية

يناقش البحث تاريخ العلاقات النبطية مع الشعوب وسكان الجوار . مسترشدين بعبارات ذات دلالة: "س ن ت/ ح ر ب" و "س ن ت/ و س ق" و "س ن ت/ ب ت ر" و "س ن ت/ م ي ت/ ه م ل ك" و "ض ب ا" و "غ ز ز" و "م ر د" و "ا م د" وغيرها من الأحداث ذات الطابع الخاص. فالنقوش تكون غير قادرة في كثير من الأحيان لرسم صورة واضحة للأحداث، بخاصة إنها ذات طبيعة لا تستطيع تغطية الكثير من الفجوات التاريخية. ولكن ما تقدمه فهو بالغ الأهمية، كالدور الذي لعبته بُصرى في الأحداث التاريخية في المنطقة. وإلى اهتمام السلوقيين/سوريا بالجزيرة العربية إذ أقاموا مستوطنات بين الفرات وجرها *Gerrha*. ولم يكن البطالمة أقل اهتماماً من السلوقيين. كما يتطرق البحث إلى أحوال المنطقة قبل الإسلام كعلاقة القبائل العربية مع اليهود وسمة هذه العلاقة، وعلاقتها مع اللحيانيين. ويلقي البحث اعتبارات خاصة لعلاقة الأنباط مع القبائل العربية/ الصفويين التي اتسمت بين المد والجزر.

ويتحدث البحث عن علاقة الأنباط مع الرومان التي كانت بين الخضوع والتمرد على الواقع. وكذلك مع علاقتهم باليهود الذين بين ظهرائهم وامتدادها مع القوتين العظميين "روما والفرس". ويلامس البحث بعضاً من أحوال قبيلة "حول" ودورها في المنطقة. وظهور اسمها في المصادر الكلاسيكية. مع المرور بما شهدته المنطقة من أحداث ذكرتھا النقوش الصفوية المتعلقة بما يُسمى بـ "ثورة د م س ي / د م ص ي". ويتطلع البحث إلى المصادر الكلاسيكية التي تفيد في فهم ما أبهم من المصادر النقشية. ويتتبع البحث أماكن الصراع من خلال تواجد النقوش الذاكرة لتلك الأحداث.